GREAT WESTERN CHEMICAL CO.
TECHNICAL CENTER
5700 N.W. FRONT AVENUE PORTLAND, OR 97210 (503) 227-1616 FAX: (503) 227-7377

December 3, 1993

Mr. Jim McCadden, Compliance Monitoring
Source Control Management
Bureau of Environmental Services
City of Portland
1120 SW 5th Avenue
Portland, OR 97204-1972

Re: Water Permit Number 400-060

Dear Mr. McCadden,

Attached are the forms with the results for the Chemax plant's discharge into the city's sewer system for the month of November, 1993, plus a copy of our industrial discharge volume for this month.

If you have any questions or further requirements, please let Ed Doheny or myself know.

Sincerely,

Todd Jessell, Manager
Vice President, Technical Operations

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:	15 DEC 1993	☐ INITIAL MONITORING	
SAMPLING PERIOD:	NOVEMBER 93	☒ PERIODIC COMPLIANCE	
SAMPLE CODE:		☐ SPECIAL COMPLIANCE	
TODAY'S DATE:	1 DECEMBER 93	☐ _____	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS.
AMMONIA	707	ND	50 mg/L				
SULFATE	854	26	500 mg/L				

cer[illegible]y under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a sy[illegible] designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted [illegible] to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: 12/3/93

Form 33-16 rev 2.01.01

Report Date: November 24, 1993
Job#: WG-931117BG-1
PO#: 15-68404
Project#: None Provided
Project: None Provided

Attention: Edward Doheny
Chemax, Inc
5700 NW Front
Portland, OR 97210

SAMPLE INFORMATION:
Date Samples Were Received By Laboratory: 11/17/93

Lab No.	Field Identification	Sample Matrix	Date	Time
1	Plant Discharge Water	Waste Water	11-17-93	1535

ANALYTICAL RESULTS:

Parameter	Method	Detection Limits	Sample Results	Units
monia-Nitrogen	EPA 350.2	0.2	ND	mg/L
Sulfate	EPA 300.0	0.5	26	mg/L

ND means none detected at or above the detection limit listed.

SM means Standard Methods for the Examination of Water and Wastewater, 1985, 16th Edition.

Sincerely,

Susan M. Coffey
President

SMC/lws

This report is for the sole and exclusive use of the above-named client. Samples are retained 15 days from the report date, or until holding time expires. Results pertain only to samples submitted.

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
7.9 PB	11-2-93	0714	0830	8.0	2500	
7.0 PB	11-2-93	1532	1645	7.0	4500	
9.1 PB	11-3-93	0915	1100	8.0	2500	
8.1 PB	11-3-93	1537	1760	9.0	4500	
6.4 PB	11-4-93	1000	1130	7.0	2500	
7.2 PB	11-4-93	1530	1700	7.0	4500	
7.0 PB	11-5-93	0850	1000	7.0	2500	
7.3 PB	11-5-93	1550	1700	7.0	4500	
7.3 PB	11-8-93	1215	1330	7.0	2500	
6.9 PB	11-9-93	0822	1000	7.0	4500	
7.5 PB	11-9-93	1550	1630	7.0	2500	
10.6 PB	11-10-93	0615	0730	9.0	4500	
7.8 PB	11-10-93	1308	1530	7.0	2500	
7.7 PB	11-11-93	1125	1240	7.0	4500	
7.2 PB	11-11-93	1530	1630	7.0	2500	
7.8 PB	11-12-93	1150	1300	7.0	4500	
6.8 KF	11-16-93	0810	0915	7.0	2500	
9.3 SH	11-16-93	1536	1700	9.0	4500	
7.2 KF	11-17-93	1110	1215	8.0	2500	
8.4 PB	11-17-93	1535	1645	7.0	4000	
7.5 KF	11-18-93	0825	0930	8.0	2500	
7.2 KF	11-18-93	1618	1730	7.0	4500	

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
7.6 RW	11-19-93	0930	1040	7.0	2500	
7.3 RW	11-22-93	1323	1450	7.0	4500	
7.0	11-22-93	1455	1600	7.0	2500	
8.0 RW	11-23-93	1305	1410	7.0	4500	
6.6	11-24-93	1145	1300	7.0	2500	
8.6	11-30-93	0945	1145	8.0	4500	
6.2	11-30-93	1355	1510	6.0	2500	

CHEMAX

GREAT WESTERN CHEMICAL CO. TECHNICAL CENTER
5700 N.W. FRONT AVENUE
PORTLAND, OREGON 97210
503/227-1616 FAX 503/227-7377

October 1, 1993

Mr. Jim McCadden, Compliance Monitoring
Source Control Management
Bureau of Environmental Services
City of Portland
1120 S.W. 5th Avenue
Portland, Oregon 97204-1972

Re: Water Permit Number 400-06.

Dear Mr. McCadden,

Attached are the forms with the results for the Chemax plant discharge into the city's sewer system for the month of September 1993, plus a copy of our industrial discharge volume for this month.

If you have any questions or further requirements, please let Ed Doheny or myself know.

Sincerely,

Todd Jessell, Manager
Vice President, Technical Operations

TJ/jj
Attachments

cc: Ed Doheny
Butch Roberts

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:	15 OCT. 93	[ ] INITIAL MONITORING	
SAMPLING PERIOD:	SEPT. 1993	[X] PERIODIC COMPLIANCE	
SAMPLE CODE:		[ ] SPECIAL COMPLIANCE	
TODAY'S DATE:	1 OCT. 1993	[ ] ________	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS
AMMONIA	707	17	50 mg/L				
SULFATE	854	470	500 mg/L				

I cert·fy under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a sy ; designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the pers .r persons who manage the system, or those persons directly responsible for gathering the information, the information submitted i· ·o the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting f information, including the possibility of fine and imprisonment for knowing violations.

Signature: [signature] Date: OCT 1 93

Form 13-14 rev 3.31.91

Report Date: September 23, 1993
Job#: WG-930915BY-1
PO#: 15-04447
Project#: None Provided
Project: None Provided

Attention: Edward Doheny
Chemax, Inc
5700 NW Front
Portland, OR 97210

SAMPLE INFORMATION:
Date Samples Were Received By Laboratory: 09/15/93

Lab No.	Field Identification	Sample Matrix	Date	Time
1	Plant Discharge Water	Waste Water	09-15-93	1200

ANALYTICAL RESULTS:

Parameter	Method	Detection Limits	Plant Discharge Water
Ammonia Nitrogen	EPA 350.2	0.2	17
Sulfate	EPA 300.0	25	470

Results expressed as mg/L unless otherwise noted.

SM means Standard Methods for the Examination of Water and Wastewater, 1985, 16th Edition.

Sincerely,

Susan M. Coffey
President

SMC/daj

This report is for the sole and exclusive use of the above-named client. Samples are retained 15 days from the report date, or until holding time expires. Results pertain only to samples submitted.

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
7.7 PB	9-1-93	1415	1530	8.0	4500	
7.1	9-2-93	1000	1040	6.0	2500	
7.3 PB	9-3-93	1400	1500	7.0	4000	
7.8 PB	9-7-93	1500	1630	8.0	4500	
8.1 PB	9-8-93	1230	1400	9.0	2500	
7.1 PB	9-9-93	0840	1000	7.0	4500	
8.5 PB	9-9-93	1305	1430	9.0	2500	
7.2 PB	9-10-93	0850	1000	7.0	4500	
7.8 PB	9-10-93	1455	1530	8.0	2500	
10.8 PB	9/13/93	11:45	1500	10.0	5000	TB
7.7 PB	9/15/93	1145	1300	7.0	4500	
6.5 PB	9/15/93	1345	1630	6.0	2500	
6.7 PB	9-16-93	0910	1030	7.0	4500	
8.0 PB	9-16-93	1316	1430	9.0	2500	
8.6 PB	9-18-93	0750	0910	9.0	4500	
6.7 PB	9-18-93	1420	1530	7.0	2500	
6.8 PB	9-20-93	1450	1530	7.0	4500	
8.5 PB	9-21-93	0945	1100	8.0	4500	
7.8 PB	9-21-93	1330	1430	7.0	2500	
8.7 PB	9-22-93	1330	1500	8.0	4500	
6.5 PB	9-22-93	1505	1600	7.0	2500	
8.5 PB	9-23-93	1130	1240	7.0	4500	

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
7.6 PD	9-23-93	1300	1400	7.0	2500	
6.8 SM	9-27-93	4:30pm	1715	7.0	2500	SD.
7.6 PD	9-28-93	1200	1300	7.0	2500	
7.8 PD	9-28-93	1343	1430	8.0	4500	
9.2 PD	9-30-93	0830	1000	9.0	2500	
8.7 ~~PD~~	9-30-93	1605	1710	9.0	4500	

CHEMAX

GREAT WESTERN CHEMICAL CO. TECHNICAL CENTER
5700 N.W. FRONT AVENUE
PORTLAND, OREGON 97210
503/227-1616 FAX 503/227-7377

July 8, 1993

Mr. Jim McCadden, Compliance Monitoring
Source Control Management
Bureau of Environmental Services
City of Portland
1120 SW 5th Avenue
Portland, OR 97204-1972

Re: Water Permit Number 400-060

Dear Mr. McCadden:

Attached are the forms with the results for the Chemax plant's discharge to the city's sewer system for the month of June, 1993, plus a copy of our industrial discharge volume for this month. We received the copy of your "Memo to File" dated June 30, 1993 and thank you for the prompt consideration of our request.

If you have any questions or further requirements, please let Ed Doheny or myself know.

Sincerely,

Todd Jessell, Manager
Vice President, Technical Operations

TJ:gw

cc: Ed Doheny
Butch Roberts

ENVIRONMENTAL AUDIT REPORT:
PRIVILEDGED DOCUMENT

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:	15 JULY 1993	☐ INITIAL MONITORING	
SAMPLING PERIOD:	JUNE 1993	☒ PERIODIC COMPLIANCE	
SAMPLE CODE:		☐ SPECIAL COMPLIANCE	
TODAY'S DATE:	6 JULY 1993	☐ _____	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS
AMMONIA	707	1.8	50 mg/L				
SULFATE	854	670	500 mg/L				

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: 7/13/93

Form 17-1a rev 1.21.91

Report Date: June 30, 1993
Job#: WG-930615AW-1
PO#: 15-06303
Project#: None Provided
Project: None Provided

Attention: Edward Doheny
Chemax, Inc
5700 NW Front
Portland, OR 97210

SAMPLE INFORMATION:
Date Samples Were Received By Laboratory: 06/15/93

Lab No.	Field Identification	Sample Matrix	Date	Time
1	Plant Discharge Water	Waste Water	06-15-93	1630

ANALYTICAL RESULTS:

PARAMETER	METHOD	DETECTION LIMITS	SAMPLE RESULTS
Ammonia-Nitrogen	SM 417-A,D	0.2	1.8
Sulfate	EPA 300.0	0.5	670

Results expressed as mg/L unless otherwise noted.

SM means Standard Methods for the Examination of Water and Wastewater, 1985, 16th Edition.

Sincerely,

Susan M. Coffey
President

SMC/daj

This report is for the sole and exclusive use of the above-named client. Samples are retained 15 days from the report date, or until holding time expires. Results pertain only to samples submitted.

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
6.8 PB	6-1-93	1005	1130	6	2500	
6.4 PB	6-1-93	1530	1700	6	4500	
6.1 PB	6-2-93	1420	1600	7	2500	
6.8 PB	6-4-93	1155	1300	7	4500	
7.8 SH	6/7/93	1330	1530	7	3000	Rw
6.3 PB	6/7/93	1530	1700	6.5	4000	Rw
8.8 SH	6-8-93	1200	1400	7.0	2500	
7.5 PB	6-9-93	900	1110	8.0	4500	
8.9 PB	6-9-93	1110	1300	8.0	2500	
7.1 PB	6-9-93	1600	1740	7.0	4500	
6.8 PB	6-10-93	1148	1300	7.0	2500	
9.6 PB	6-11-93	1525	1700	9.0	4600	
6.6 PB	6-14-93	0635	0800	7.0	2500	
7.9 PB	6-14-93	1620	1730	7.0	4000	
7.0 PB	6-15-93	0940	1100	7.0	2500	
8.7 PB	6-17-93	0910	1000	7.0	4000	
10.1 SH	6-17-93	1240	1500	9.0	2500	
8.9 PB	6-18-93	0849	1140	8.0	4500	
10.5 PB	6-18-93	1430	1600	9.0	2500	
10.7 PB	6-21-93	1600	1745	10	4500	JO
10.0 PB	6-22-93	0625	0750	9.0	2500	
7.9 PB	6-22-93	1316	1400	8.0	4500	

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
8.0 PB	6-22-93	1405	1510	8.0	2500	
6.5 PB	6-22-93	1520	1700	6.0	4500	
10.0 PB	6-23-93	0710	0900	9.0	2500	
6.3 PB	6-23-93	1435	1600	6.0	4500	
8.7 PB	6-24-93	0925	1030	9.0	2500	
8.3 PB	6-24-93	1515	1700	9.0	4500	
6.8 PB	6-25-93	1600	1700	8.0	2500	
6.6 PB	6-28-93	1415	1600	6.0	4500	
7.2 BK	6-29-93	0855	1030	7.0	2500	
6.2 PB	6-29-93	1450	1600	6.0	4500	
8.4 PB	6-30-93	0915	1100	7.0	2500	
6.5 PB	6-30-93	1635	1800	7.0	4500	

CHEMAX

GREAT WESTERN CHEMICAL CO. TECHNICAL CENTER
5700 N.W. FRONT AVENUE
PORTLAND, OREGON 97210
503/227-1616 FAX 503/227-7377

June 4, 1993

Source Control Management
Bureau of Environmental Services
City of Portland
1120 SW 5th Avenue
Portland, OR 97204-1972

Attn: Mr. Jim McCadden, Compliance Monitoring

Re: Water Permit Number 400-060

Dear Mr. McCadden,

Attached are the forms with the results for the Chemax plants' discharge to the city's sewer system for the month of May, 1993, plus a copy of our industrial discharge volume for this month.

The ammonia level is slightly above the limit and we have identified the source as a couple of pounds of ammonium chloride (a non-hazardous material) was washed into our discharge system during clean-up the day before that discharge batch was sampled. This was the first time that material has been used this year. Corrective measures are being instituted. We look forward to your visit on June 10, 1993.

If you have any questions or there are further requirements, please let Ed Doheny or myself know.

Sincerely,

Todd Jessell, Manager
Vice President Technical Operations

TJ/nw

ENVIRONMENTAL AUDIT REPORT:
PRIVILEDGED DOCUMENT

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:	15 JUNE 1993	☐ INITIAL MONITORING	
SAMPLING PERIOD:	MAY 1993	☒ PERIODIC COMPLIANCE	
SAMPLE CODE:		☐ SPECIAL COMPLIANCE	
TODAY'S DATE:	4 JUNE 1993	☐ _____	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS
AMMONIA	707	51	50 mg/L				
SULFATE	854	59	500 mg/L				

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: 6/7/93

Report Date: June 3, 1993
Job#: WG-930514AO-1
PO#: 15-06149
Project#: None Provided
Project: None Provided

Attention: Edward Doheny
Chemax, Inc
5700 NW Front
Portland, OR 97210

SAMPLE INFORMATION:
Date Samples Were Received By Laboratory: 05/14/93

Lab No.	Field Identification	Sample Matrix	Date	Time
1	Plant Discharge Water	Waste Water	05-14-93	1605

ANALYTICAL RESULTS:

Parameter	Method	Detection Limits	Sample Results
Ammonia Nitrogen	EPA 350.2	0.8	51
Sulfate	EPA 300.0	0.5	59

Results expressed as mg/L unless otherwise noted.

Sincerely,

Victor A. Perry,
Quality Assurance

VAP/mlh

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
10.5 PB	3 MAY	0835	1030	10	4500	[illegible]
9.2 PB	4 MAY 93	1105	1342	9	4500	[illegible]
6.5 PB	4 MAY 93	1555	1748	7	2500	[illegible]
7.5 PB	5 MAY 93	1450	1648	7	4500	[illegible]
6.5 PB	6 MAY 93	0740	0913	7	2500	[illegible]
6.9 PB	7 MAY 93	0635	1000	7	4500	[illegible]
6.8 PB	7 MAY 93	1450	1610	7	2500	[illegible]
6.2 PB	11 MAY 93	0940	1135	7	4500	[illegible]
9.4 PB	11 MAY 93	1340	1545	9	2500	[illegible]
9.5 PB	12 MAY 93	0935	1110	9	4500	[illegible]
9.4 PB	12 MAY 93	1430	1600	9	2500	[illegible]
9.2 PB	13 MAY 93	1110	1300	8	4500	[illegible]
8.4 PB	13 MAY 93	1430	1600	8	2500	[illegible]
7.6 PB	14 MAY 93	1558	1700	7	4000	[illegible]
8.3 PB	18 MAY 93	0620	0800	9	2500	[illegible]
6.7 PB	18 MAY 93	1450	1620	7	4000	[illegible]
7.2 PB	19 MAY 93	0745	0930	6	2500	[illegible]
6.8 PB	19 MAY 93	1425	1630	6	4250	[illegible]
6.2 PB	20 MAY 93	0755	0945	6	2500	[illegible]
6.7 PB	20 MAY 93	1240	1420	6	4500	[illegible]
6.2 PB	20 MAY 93	1550	1723	7	2500	[illegible]
7.6 PB	21 MAY 93	1445	1630	7	4500	[illegible]

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
6.5 EA	5-25-93	0720	0900	6	2500	
8.4 PB	5-25-93	0935	1130	9	4500	
9.5 PB	5-25-93	1440	1600	9	2500	
8.2 PB	5-26-93	0905	1115	8	4500	
7.5 PB	5-26-93	1130	1245	7	2500	
7.0 PB	5-27-93	0845	1000	7	4500	
6.7 PB	5-27-93	1310	1500	7	2500	
7.7 PB	5-28-93	1200	1430	7	4500	

CHEMAX

GREAT WESTERN CHEMICAL CO. TECHNICAL CENTER
5700 N.W. FRONT AVENUE
PORTLAND, OREGON 97210
503/227-1616 · FAX 503/227-7377

May 10, 1993

Source Control Management
Bureau of Environmental Services
City of Portland
1120 S.W. 5th Ave.
Portland, OR 97204-1972

RE: Water Permit Member 400-060

Dear Mr. McCadden

Attached are the forms with the results of the Chemax plant's discharge to the city's sewer system for the month of April 1993, A copy of our industrial discharge volume for this month and the signed split sample authorization form.

As reported to you by Ed Doheny verbally, the sulfate level is higher than the specification. Since the sulfate level is being studied for revision or elimination, Chemax was not requested to do any additional testing. We are working to bring the sulfate level down to below the 500 ppm specification.

If you have any questions or further requirements, please let Ed Doheny or myself know.

Sincerely,

Todd Jessell
V.P. Technical Operations

TJ/nw

ENVIRONMENTAL AUDIT REPORT:
PRIVILEDGED DOCUMENT

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:	15 MAY 1993	☐ INITIAL MONITORING	
SAMPLING PERIOD:	APRIL 1993	☒ PERIODIC COMPLIANCE	
SAMPLE CODE:		☐ SPECIAL COMPLIANCE	
TODAY'S DATE:		☐ _____	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS
AMMONIA	707	2.9	50 mg/L				
SULFATE	854	990	500 mg/L				

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: 5/11/93

Report Date: May 5, 1993
Job#: WG-930420AS-1
PO#: 15-95942
Project#: None Provided
Project: None Provided

Attention: Edward Doheny
Chemax, Inc
5700 NW Front
Portland, OR 97210

SAMPLE INFORMATION:
Date Samples Were Received By Laboratory: 04/20/93

Lab No.	Field Identification	Sample Matrix	Date	Time
1	Plant Discharge Water	Waste Water	04-20-93	0955

ANALYTICAL RESULTS:

PARAMETER	METHOD	DETECTION LIMITS	SAMPLE RESULTS
[illegible]monia	EPA 350.2	0.2	2.9
[illegible]lfate	EPA 300.0	0.5	990

Results expressed as mg/L unless otherwise noted.

Sincerely,

Susan M. Coffey
President

SMC/mlh

This report is for the sole and exclusive use of the above-named client. Samples are retained 15 days from the report date, or until holding time expires. Results pertain only to samples submitted.

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
9.0 DA	4-1-93	1130	1300	10	4500	
10.0 DA	4-1-97	1605	1700	10	2500	
9.8/7	5APR	0945	1100	9	4000	
6.7/PB	5APR	1400	1530	6	2500	
10.8 DA	6APR	1145	1315	10	4500	
9.7/PB	6APR	1520	1600	10	2500	
9.8/PB	7APR	1600	1730	10	4500	
8.4/PB	8APR	1310	1530	8	2500	
9.0	9APR	1600	1730	10	4500	
9.8 DA	13APR	0800	0930	9	2500	
9.7 PB	13APR	1300	1430	10	4500	
6.7 PB	14APR	1615	1730	7	2500	
8.9 PB	14APR	1420	1630	9	4500	
8.1 PB	16APR	1420	1700	8.2	2500	
8.8 PB	20APR93	0647	830	9.0	4000	
8.4 PB	20APR93	0942	1100	9.0	2500	
6.3 PB	21APR93	1100	1330	8	4500	
6.7 PB	21APR93	1350	1600	7	2500	
6.8 PB	22APR93	0915	1200	9	4500	
6.4 DA	22APR93	1305	1500	10	2500	
7.9 DA	23APR93	0915	1123	8	4500	
10.8 DA	23APR93	1315	1510	10	2500	

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
8.2 BA	4-26-93	0905	1100	7.0	4500	⊗
9.7 PB	4-26-93	1400	1630	9.0	2500	⊗
7.7 PB	4-27-93	1430	1600	7.0	4500	⊗
6.2 PB	4-28-93	0952	1103	7.0	2500	⊗
7.3 PD	4-29-93	0730	0910	7.0	4000	⊗
8.7 PB	4-29-93	1310	1500	9.0	2500	⊗
9.8 PB	4-30-93	1400	1510	9.0	4500	⊗

SPLIT SAMPLE AUTHORIZATION FORM

Company name Chemax

Address 5700 N.W. Front Ave., Portland, OR 97210

Primary Contact Todd Jessell

Title V.P. Technical Operations / Chemax Phone (503) 227-1616

Secondary Contact Edward Doheny

Title Chemist-Regulatory Compliance Phone (503) 227-1616

Admission procedures Sign in at reception desk and ask to see the people listed above. If they are not available, request the plant or maintenance supervisor or the branch services manager to escort the city personnel to the collection site.

Agreements:

I have read the City of Portland's split sample policy and understand all requirements and agree to follow the conditions outlined in the policy. I further agree to notify our private laboratory of the chain of custody requirements and will ensure their proper use by the laboratory. I understand that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Signature of responsible official

Title V.P. Technical Operations / Chemax

Date 27 th day of April 1993

CHEMAX

GREAT WESTERN CHEMICAL CO. TECHNICAL CENTER
5700 N.W. FRONT AVENUE
PORTLAND, OREGON 97210
503/227-1616 FAX 503/227-7377

April 5, 1993

Source Control Management
Bureau of Environmental Services
City of Portland
1120 S.W. 5th Ave.
Portland, OR 97204-1972

Attn: Mr. Jim McCadden, Compliance Monitoring

RE: Water Permit Number 400-060

Dear Mr. McCadden:

Attached are the forms with the results of the Chemax plants' discharge to the city's sewer system for the month of March 1993, plus a copy of our industrial discharge volume for this month.

If you have any questions or further requirements, please let Ed Doheny or myself know.

Sincerely,

Todd Jessell,
Manager

TJ/cjs

cc: Ed Doheny
Butch Roberts
Craig Roberts

ENVIRONMENTAL AUDIT REPORT:
PRIVILEDGED DOCUMENT

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:	15 APRIL 93	☐ INITIAL MONITORING	
SAMPLING PERIOD:	MARCH 1993	☒ PERIODIC COMPLIANCE	
SAMPLE CODE:		☐ SPECIAL COMPLIANCE	
TODAY'S DATE:	5 APRIL 93	☐ _____	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS
AMMONIA	707	24	50 mg/L				
SULFATE	854	61	500 mg/L				

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a sys[illegible] designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the pers[illegible] persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is [illegible] to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting f[illegible] information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: 4/5/93

Form 17-1a rev 2.11.01

Report Date: March 29, 1993
Job#: WG-930317BL-1
PO#: 15-93611
Project#: None Provided
Project: None Provided

Attention: Edward Doheny
Chemax, Inc
5700 NW Front
Portland, OR 97210

SAMPLE INFORMATION:
Date Samples Were Received By Laboratory: 03/17/93

Lab No.	Field Identification	Sample Matrix	Date	Time
1	Plant Discharge Water	Waste Water	03-17-93	1405

ANALYTICAL RESULTS:

PARAMETER	METHOD	DETECTION LIMITS	SAMPLE RESULTS
monia-Nitrogen	EPA 350.2	0.1	24
Sulfate	EPA 300.0	0.5	61

Results expressed as mg/L unless otherwise noted.

SM means Standard Methods for the Examination of Water and Wastewater, 1985, 16th Edition.

Sincerely,

Susan M. Coffey
President

SMC/mlh

This report is for the sole and exclusive use of the above-named client. Samples are retained 15 days from the report date, or until holding time expires. Results pertain only to samples submitted.

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
9.5 BH	3-2-93	0915	1100	10	4500	
10.4 BH	3-2-93	1605	1700	10	2500	
10.5 BH	3-3-93	1620	1700	10	4500	
7.7 BH	3-4-93	0945	1100	9	2500	
10.4 BH	3-4-93	1330	1500	11	4500	
7.3 BH	3-5-93	1505	1600	9	2500	
7.3 RO	3-10-93	0640	0745	7	3000	CR
8.4 BH	3-11-93	0630	830	8	2500	
9.5 BH	3-11-93	1400	1700	8	4500	
9.5 BH	3-12-93	1100	1410	10	2500	
8.7 BH	3-16-93	0740	0900	9	4500	
6.2 RO	3-17-93	0630	0900	7	2500	
9.3 BH	3-17-93	1455	1615	9	4500	
6.4 BH	3-17-93	1615	1700	7	2500	
9.9 BH	3-18-93	1200	1330	10	4500	
7.1	3-19-93	0600	0730	8	2500	
6.9 BH	3-19-93	1200	1330	7	4500	
9.6 BH	3-23-93	0655	0815	10	2500	
7.6 BH	3-23-93	1600	1715	8	4500	
10.2 BH	3-24-93	1031	1200	8	2500	
7.6 BH	3-24-93	1510	1630	8	4500	
6.5 BH	3-25-93	0940	1100	7	2500	
10.8 BH	3-25-93	1630	1800	10	4500	
9.7 BH	3-26-93	1100	1230	10	2500	

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
6.7 DW	3-30-93	0710	0830	7	4500	
9.9 DW	3-30-93	1130	1200	10	2500	
6.3 DW	3-31-93	0800	0930	7	4500	
10.0 DW	3-31-93	1300	1400	10	2500	

CHEMAX

GREAT WESTERN CHEMICAL CO. TECHNICAL CENTER
5700 N.W. FRONT AVENUE
PORTLAND, OREGON 97210
503/227-1616 FAX 503/227-7377

March 1, 1993

Source Control Management
Bureau of Environmental Services
City of Portland
1120 S.W. 5th Ave.
Portland, OR 97204-1972

Attn: Mr. Jim McCadden, Compliance Monitoring

RE: Water Permit Number 400-060

Dear Mr. McCadden:

Attached are the forms with the results of the Chemax plants' discharge to the city's sewer system for the month of February 1993, plus a copy of our industrial discharge volume for this month.

If you have any questions or further requirements, please let Ed Doheny or myself know.

Sincerely,

Todd Jessell
Manager

TJ/cjs

cc: Ed Doheny
Butch Roberts
Craig Roberts

ENVIRONMENTAL AUDIT REPORT:
PRIVILEDGED DOCUMENT

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:	15 MARCH 93	☐ INITIAL MONITORING	
SAMPLING PERIOD:	FEBRUARY 93	☒ PERIODIC COMPLIANCE	
SAMPLE CODE:		☐ SPECIAL COMPLIANCE	
TODAY'S DATE:	1 MARCH 93	☐ _____	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS
AMMONIA	707	16	50 mg/L				
SULFATE	854	57	500 mg/L				

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: 3/1/93

Report Date: February 25, 1993
Job#: WG-930216BK-1
PO#: 15-89623
Project#: None
Project: None

Attention: Edward Doheny
Chemax, Inc
5700 NW Front
Portland, OR 97210

SAMPLE INFORMATION:
Date Samples Were Received By Laboratory: 02/16/93

Lab No.	Field Identification	Sample Matrix	Date	Time
1	Plant Discharge Water	Waste Water	02-16-93	1300

ANALYTICAL RESULTS:

PARAMETER	METHOD	DETECTION LIMITS	SAMPLE RESULTS	UNITS
·monia Nitrogen	EPA 350.2	0.2	16	mg/L
Sulfate	EPA 300.0	0.5	57	mg/L

Sincerely,

Susan M. Coffey

Susan Coffey
President

SMC/lws

This report is for the sole and exclusive use of the above-named client. Samples are retained 15 days from the report date, or until holding time expires. Results pertain only to samples submitted.

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
7.5 BH	3FEB	0900	1000	9	2500	CR
10.5 BH	3FEB	1500	1605	8	4500	
10.5 BH	5FEB	1325	1350	8	2500	
7.1 BH	9FEB	1100	1205	7	4500	
9.7 BH	9FEB	1445	1520	9	2500	
7. BH	10FEB	1530	1600	8	4500	
10.7 BH	11 FEB	0610	0705	9	2500	
10.4 BH	11FEB	0810	1530	9	4500	
7.4 BH	12FEB	0836	0940	7	2500	
7.6 BH	16Feb	1145	1280	7	4500	
6.6 BH	16FEB	1620	1630	7	2500	
6.5 BH	18 FEB93	0700	0815	7	4500	
6.7 BH	18 FEB93	1430	1540	7	2500	
8.5 BH	23FEB	0815	0945	9	4000	CR
10.5 BH	23 Feb	1100	1215	9	2500	
10 BH	24 Feb	0800	0900	9	4500	
8.7 BH	24FEB	1200	1235	9	2500	
9.5 BH	26 Feb	0725	0900	9	4500	
8.4 BH	26 Feb	1120	1225	8	2500	

CHEMAX

GREAT WESTERN CHEMICAL CO. TECHNICAL CENTER
5700 N.W. FRONT AVENUE
PORTLAND, OREGON 97210
503/227-1616 FAX 503/227-7377

Feb. 1, 1993

Source Control Management
Bureau of Environmental Services
City of Portland
1120 S.W. 5th Ave.
Portland, OR 97204-1972

Attn: Mr. Jim McCadden, Compliance Monitoring

RE: Water Permit Number 400-060

Dear Mr. McCadden:

Attached are the forms with the results of the Chemax plants' discharge to the city's sewer system for the month of January 1993, plus a copy of our industrial discharge volume for this month.

If you have any questions or further requirements, please let Ed Doheny or myself know.

Sincerely,

Todd Jessell,
Manager

TJ/cjs

cc: Ed Doheny
Butch Roberts
Craig Roberts

ENVIRONMENTAL AUDIT REPORT:
PRIVILEDGED DOCUMENT

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:	15 FEB. 1993	☐ INITIAL MONITORING	
SAMPLING PERIOD:	JANUARY 1993	☒ PERIODIC COMPLIANCE	
SAMPLE CODE:		☐ SPECIAL COMPLIANCE	
TODAY'S DATE:	1 FEB. 1993	☐ _____	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS
AMMONIA	707	1.5	50 mg/L				
SULFATE	854	375	500 mg/L				

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: 2/6/93

Form 33-1a rev 3.21.01

Report Date: January 25, 1993
Job#: WG-930114AL-1
PO#: 15-80486
Project#: None
Project: None

Attention: Edward Doheny
Chemax, Inc
5700 NW Front
Portland, OR 97210

SAMPLE INFORMATION:
Date Samples Were Received By Laboratory: 01/14/93

Lab No.	Field Identification	Sample Matrix	Date	Time
1	Plant Discharge Water	Waste Water	01-14-93	1120

ANALYTICAL RESULTS:

PARAMETER	METHOD	DETECTION LIMITS	SAMPLE RESULTS	UNITS
Ammonia Nitrogen	EPA 350.2	0.2	1.5	mg/L
Sulfate	EPA 300.0	0.5	375	mg/L

Sincerely,

Susan M. Coffey

Susan Coffey
President

SMC/lws

This report is for the sole and exclusive use of the above-named client. Samples are retained 15 days from the report date, or until holding time expires. Results pertain only to samples submitted.

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
6.7	4 JAN 93	0745	0900	7	2500	
10.0 BH	5 JAN 93	1115	1300	10	4500	
7.6 BH	5 JAN 93	1540	1730	7	2500	
8.7 BH	6 JAN 93	1140	1430	7	4500	
8.1 BH	6 JAN 93	1515	1740	7	2500	
10.5 BH	7 JAN 93	0930	1100	8	4500	
6.2 BH	7 JAN 93	1200	1310	6	2500	
6.6	8 Jan 93	1320	1600	6	4500	
7.5	12 JAN 93	0710	1200	6	2500	
10.2	12 Jan 93	1415	1700	9	4500	
6.8 BH	13 JAN 93	1240	1320	7	2000	
9.6	13 Jan 93	1410	1435	9	4500	
9.2 BH	14 Jan 93	1115	1135	7	2500	
9.8 BH	15 Jan 93	0730	0750	7	4500	
6.9 BH	15 Jan 93	1415	1440	6	2500	
10.3 BH	19 JAN 93	0900	0940	9	4500	
8.8 BH	19 JAN 93	1415	1430	7	2500	
10.2	20 Jan 93	1600	1615	10	4500	
6.6	21 Jan 93	1100	1135	7	2500	
9.3 KW	21 Jan 93	1610	1625	9	4500	
7.2 KW	25 Jan 93	1320	1340	9	4500	
7.2	25 Jan 93	1600	1615	7	2500	

CHEMAX DISCHARGE RECORD
pH Specification: 6.0 - 11.0

LAB pH	TIME OF DISCHARGE DATE	START	FINISH	pH PAPER	VOLUME	PLANT INITIAL
7.6 BH	26 Jan 93	1615	1625	8	4500	
BH 10.0	27 Jan 93	0740	0800	9	2500	
KW 9.9	28 JAN	1600	1730	9	4500	CR

ENVIRONMENTAL AUDIT REPORT:
PRIVILEDGED DOCUMENT

GENERAL PERMIT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORM WATER DISCHARGE PERMIT

Department of Environmental Quality
811 Southwest Sixth Avenue, Portland, OR
Telephone: (503) 229-5696

Issued pursuant to ORS 468.740 and The Federal Clean Water Act

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ISSUED TO:
ISSUED 10-7-92 GEN12H ~~Multnomah/NWR~~
~~File No. 107172~~

Great Western Chemical Company
808 SW 15th Avenue
Portland OR 97205
Re: Chemax/Great Western Technical Center
5700 NW Front Avenue, Portland, OR 97210

SOURCES COVERED BY THIS PERMIT:

Heavy industrial activities associated with Standard Industrial Classification (SIC) Codes 28; 29; 30; 31; 32; 33; including chemical manufacturing; petroleum refining; rubber manufacturing; leather tanning; stone, clay, glass, and concrete products; and primary metals industry. Also covered by this permit is steam electric power generation, including coal and hogged fuel handling sites.

Lydia Taylor

Lydia Taylor, Administrator

SEP 24 1991
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct water pollution control facilities and to discharge storm water to public waters in accordance with a storm water pollution control plan which has been prepared by the permittee and any other limitations specified in this permit. All discharges shall be in accordance with the attached schedules as follows:

Each other direct and indirect waste discharge to public waters is prohibited unless covered by another NPDES permit.

This permit does not relieve the permittee from responsibility for compliance with any other applicable federal, state, or local law, rule, standard, ordinance, order, judgment, or decree.

b. Controls Each operator covered by this permit shall develop a description of controls appropriate for the site and a time line for implementing such controls. The following minimum components shall be addressed along with a schedule for implementation:

(1) Storm Water Management - The plan shall contain a narrative description of the materials and storm water management practices employed or scheduled for employment, to minimize contact of significant materials with storm water runoff; structural and non-structural control measures to reduce pollutants in storm water runoff; treatment (if any) and ultimate disposal of solid or fluid wastes other than by surface discharge. In developing the plan the permittee shall consider but not be limited to the following management practices:

A. Containment - All hazardous chemicals shall be stored within berms or other secondary containment devices to prevent leaks and spills from entering storm water runoff.

B. Oil & Grease Separation - Oil/water separators, booms, skimmers or other methods should be employed to minimize oil contaminated storm water discharge.

C. Debris & Sediment Control - Screens, booms, sediment ponds or other methods should be employed to reduce debris and sediment in storm water discharge.

D. Waste Chemical Disposal - Waste chemicals such as antifreeze, degreasers, used oils, and etc. shall be recycled or disposed of in an approved manner and in a way which prevents them from entering storm water discharges.

E. Storm Water Diversion - Wherever possible, storm water should be diverted away from materials manufacturing, storage and other areas of potential storm water contamination.

F. Covered Storage or Manufacturing Areas - Wherever practicable, fueling operations, materials manufacturing and storage areas should be covered to prevent contact with storm water.

(2) Spill Prevention and Response Procedures - Areas where potential spills of significant materials can impact storm water runoff and their associated drainage points shall be clearly identified. Methods to prevent spills along with cleanup and notification procedures shall be identified in the plan and made available to the appropriate personnel. The required cleanup equipment must be on site or readily available.

3. Storm water carrying pollutants regulated by this permit shall not be allowed to discharge to seepage ponds, seepage pits, dry wells, injection wells, or any other on-site disposal facilities if discharge to surface waters is possible. If discharge to surface waters is not possible and on-site disposal methods are used, the storm water discharge limitations and monitoring requirements of this permit shall still apply, in addition to the limitations and restrictions found in OAR 340-44-050, Waste Disposal for Surface Drainage and OAR 340, Division 40, Groundwater Quality Protection.

4. **Specific Storm Water Discharge Limitations**
(These limitations apply to each point source discharge.)

Parameters	Limitations
Oil & Grease	Shall not exceed 10 mg/L
pH	Shall be between 6 and 9
TSS	Shall not exceed 50 mg/L*
Toxicity	No discharge of toxic chemicals in "toxic concentrations"** permitted

* From coal handling or storage facilities.

** Toxic concentrations is defined in the definitions, page 7 of attached General Conditions.

5. Notwithstanding the effluent limitations in this permit, no wastes shall be discharged and no activities shall be conducted which will violate applicable water quality standards as adopted in OAR 340, Division 41, except within a mixing zone in the receiving stream of a size which would provide a 10:1 dilution of the storm water discharged.

6. Storm Water Only - This permit regulates the discharge of storm water only. It does not authorize the discharge of process wastewaters, cooling waters, or any other wastewaters associated with the facility. Other discharges must be addressed in a separate NPDES permit.

SCHEDULE C

Compliance Conditions and Schedules (unless otherwise approved in writing by the Department)

1. Within 180 days of receiving this permit, the permittee shall complete a Storm Water Pollution Control Plan (SWPCP) as required by Schedule A, Condition 1.

2. The permittee shall be in compliance with the SWPCP and the effluent limitations in this permit within 360 days of receiving this permit.

3. The permittee is expected to meet the compliance dates which have been established in this schedule. Either prior to or no later than 14 days following any lapsed compliance date, the permittee shall submit to the Department a notice of compliance or noncompliance with the established schedule. The Department may revise a schedule of compliance if good and valid cause over which the permittee has little or no control has been determined.

4. For new facilities, the SWPCP shall be prepared and implemented prior to startup of the facility.

STORM WATER NPDES PERMIT GENERAL CONDITIONS

SECTION A. STANDARD CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Oregon Revised Statutes (ORS) 468.720 and is grounds for enforcement action; for permit termination; suspension or modification; or for denial of a permit renewal application.

2. Penalties for Violations of Permit Conditions

Oregon Law (ORS 468.990) classifies a willful or negligent violation of the terms of a permit or failure to get a permit as a misdemeanor and a person convicted thereof shall be punishable by a fine of not more than $25,000 or by imprisonment for not more than one year, or by both. Each day of violation constitutes a separate offense.

In addition to the criminal penalties specified above, Oregon Law (ORS 468.140) also allows the Director to impose civil penalties up to $10,000 per day for violation of the terms or conditions of a permit.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment and human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Permit Actions

The Department may revoke a general permit as it applies to any person and require such person to apply for and obtain an individual NPDES permit if:

a. The covered source or activity is a significant contributor of pollution or creates other environmental problems;

b. The permittee is not in compliance with the terms and conditions of this general permit; or

c. Conditions or standards have changed so that the source or activity no longer qualifies for a general permit.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit.

2. Duty to Halt or Reduce Activity

Upon reduction, loss, or failure of a storm water treatment or control facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control all discharges until the facility is restored or an alternative method of treatment is provided.

3. Bypass of Treatment Facilities

Bypassing of treatment facilities is generally prohibited.

4. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering public waters, creating a nuisance or creating a health hazard.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Sampling and measurements taken as required herein shall be representative of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and/or the Storm Water Pollution Control Plan, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Department.

2. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

8. Inspection and Entry

The permittee shall allow the Department, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and

d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

SECTION D. REPORTING REQUIREMENTS

1. Anticipated Noncompliance

The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

2. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and submits a transfer application within 60 days of the change in property interest. The transfer application will require the transferee to commit to fully comply with all the terms and conditions of the permit and the rules of the Commission.

3. Twenty-Four Hour Reporting

The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally (by telephone) within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 working days of the time the permittee becomes aware of the circumstances. The written submission shall contain:

7. Falsification of Reports

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

SECTION E. DEFINITIONS AND ACRONYMS

1. "BOD_5" means five-day biochemical oxygen demand.
2. "COD" means chemical oxygen demand.
3. "Department" means Department of Environmental Quality
4. "FC" means fecal coliform bacteria.
5. "MGD" means million gallons per day.
6. "mg/L" means milligrams per liter.
7. "mL/L" means milliliters per liter.
8. "Point Source Discharge" means a discharge from any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, or conduit.
9. "Reportable Quantities" means those quantities of hazardous substances listed in Table 117.3 of The Code of Federal Regulations, 40 CFR 117.
10. "Significant material" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.
11. "TOC" means total organic carbon
12. "TOX" means total organic halides
13. "TSS" means total suspended solids (non-filterable residue).

CITY OF
PORTLAND, OREGON
BUREAU OF ENVIRONMENTAL SERVICES

Earl Blumenauer, Commissioner
Mary T. Nolan, Director
1120 S.W. 5th, Rm. 400
Portland, Oregon 97204-1972
(503) 796-7740
FAX: (503) 796-6995

MUNICIPAL PRETREATMENT PROGRAM

WASTE DISCHARGE PERMIT

ISSUED TO:	CHEMAX
SIC CODE:	2899 & 2842
PLANT TYPE:	Chemical Products Specialty Cleaners & Sanitizers
EPA CATEGORY:	None
LOCATION:	5700 N.W. Front Ave. PORTLAND, OR 97210
MAILING ADDRESS:	5700 N.W. Front Ave. PORTLAND, OR 97210
RESPONSIBLE OFFICIAL:	Todd Jessell GWTC Manager PHONE NO: 227-1616

APPLICATION FEE RECEIVED: Modification of Permit expiring 1-10-94

EFFECTIVE DATE: June 15, 1991

EXPIRATION DATE: January 10, 1994

DIRECTOR OF ENVIRONMENTAL SERVICES: Robert W. Ries DATE: 6-10-91
Mary T. Nolan

PREPARED BY: Annette R. Riley
CHECKED BY: [illegible]

ENVIRONMENTAL AUDIT REPORT:
PRIVILEDGED DOCUMENT

CONTENTS

INTRODUCTION

The permittee is authorized to discharge industrial wastewater to the City of Portland's sewer system in compliance with City Code and any applicable provisions of federal or state laws or regulations and in accordance with discharge point(s), effluent limitations, monitoring requirements, and all other conditions set forth herein.

SCHEDULE A

Waste Discharge Limitations Not To Be Exceeded After 6/15/91.

Applicable Regulations: Chapters 17.34 and 17.36 of the Code of the City of Portland and the Administrative Rules adopted thereunder.

Pollutant Property	Daily Maximum
pH (range)	5.5 - 11.5
Ammonia	50 mg/L
Sulfate	500 mg/L
Arsenic	0.3 mg/L
Cadmium	0.7 mg/L
Chlorinated Hydrocarbons	0.5 mg/L
Chromium	3.8 mg/L
Copper	2.3 mg/L
Cyanide	1.2 mg/L
Lead	0.7 mg/L
Mercury	0.014 mg/L
Nickel	3.0 mg/L
Phenolics	1.0 mg/L
Silver	0.4 mg/L
Sulfide	50 mg/L
Zinc	4.0 mg/L
Fats, Oils and Grease	
Non-polar	100.0 mg/L
Polar	500.0 mg/L

Discharges of wastestreams which have a closed cup flash point of less than 140 degrees Fahrenheit are prohibited.

Notes:

1. This schedule may be revised upon written notification by the City to accommodate process changes by the permittee or as determined by the Director of Environmental Services.

2. In addition to the limits stated in Schedule A, the permittee shall comply with all other applicable City, State, and Federal regulations.

SCHEDULE B

Minimum Monitoring and Reporting Requirements

I. Initial Monitoring Reporting Requirements.

SAMPLE TYPE	FREQUENCY	CRITICAL DATE(S) REPORTING REQUIREMENT
Ammonia	grab	monthly	15th of following month
Sulfate	grab	monthly	" " " "

Notes:

1. The initial monitoring requirement covers those parameters for which discharge limits changed. This monitoring can be performed simultaneously with the periodic monitoring required under this permit. A Final Compliance Report will be required following this 3 month period (See Schedule C).

2. All Notes under Schedule B II Periodic Compliance apply to this monitoring requirement.

SCHEDULE B

Minimum Monitoring and Reporting Requirements

II. Periodic Compliance Report (Continuous Requirement)

	SAMPLE TYPE	FREQUENCY	REPORTING REQUIREMENT
Ammonia	grab	monthly	15th of following month
Sulfate	grab	monthly	" " " "
pH (calibrated meter)	grab	each batch	" " " "
Volume & time of discharge		each batch	" " " "

Notes:

1. Periodic Compliance Reports are to be submitted to the Source Control Section prior to the 15th of the following month.

2. All sampling shall be taken at the designated sampling location (Appendix 2).

3. See SCHEDULE E 4.e) Monitoring for retest requirements.

4. If the permittee monitors any pollutant more frequently than required by this permit, in accordance 40 CFR Part 136 or other EPA approved methods, the results of such monitoring shall be submitted with the applicable periodic report.

5. The permittee shall analyze for all listed parameters plus any other which might be expected to be present in significant quantities.

6. **PERIODIC COMPLIANCE REPORTS** are to be submitted by the 15th of each month following the report period for each sampling location. The reports shall consist of:

   a. Sample analysis report submitted on City form No.13-1a.

   b. Statement of Compliance/non-compliance signed by the officially designated contact person.

   c. Copies of all laboratory analysis sheets showing analytical methods used and quality assurance/quality control.

   d. Copies of pH charts showing any violation occurring during the month.

   e. Any other reports as may be required.

7. All monitoring results are to be mailed to:

   Source Control Management
   Bureau of Environmental Services
   City of Portland
   1120 S.W. 5th Ave., Rm. 400
   Portland, Or. 97204-1972

ATTENTION: COMPLIANCE MONITORING

SCHEDULE C

COMPLIANCE REPORTS

1. **PERIODIC COMPLIANCE REPORTS** are to be submitted by the 15th of each month following the report period for each sampling location. The reports shall consist of:

   a. Sample analysis report submitted on City form No.13-1a.

   b. Statement of Compliance/non-compliance signed by the officially designated contact person.

   c. Copies of all laboratory analysis sheets showing analytical methods used and quality assurance/quality control.

   d. Copies of pH charts showing any violation occurring during the month.

   e. Any other reports as may be required.

2. To comply with Section 17.34.090 of the Code of the City of Portland the permittee shall submit to the Industrial Wastewater Management Section an Accidental Spill Prevention Plan by September 15, 1991. The plan shall include the following elements:

   a. A description of the hazardous substances handled and their potential points of entry into the City sewer system or storm runoff; and

   b. A description of the measures to be taken to prevent entry at the described points before a spill occurs; and

   c. Measures to be taken to contain a spill if one occurs; and

   d. A description of employee training in the prevention and control of spills.

   e. A posted notice informing employees of the requirement to notify the Bureau of Environmental Services in case of spills or uncontrolled discharges.

3. A Final Compliance Report stating:

1) the nature and concentration of all prohibited or regulated substances contained in the discharge and the average and maximum daily flow in gallons; and

2) whether the permit standards and requirements are being met on a consistent basis and, if not, what additional operation and maintenance and pretreatment is necessary to come into compliance;

must be submitted following the first three months (90 days) of operation under this permit. This Final Compliance Report is due September 15, 1991.

SCHEDULE D

1. Due to the batch neutralization which occurs during the cleaning operations a record of the amount and type of neutralizing agent used shall be maintained and available on site for review during inspection. A record of calibration and maintenance of the pH equipment shall be maintained.

Schedule E
GENERAL CONDITIONS

1. **Authorized Discharge**

All discharge and activities authorized herein shall be consistent with the terms and conditions of this permit, Chapter 17.34 of the City Code and the Administrative rules. The discharge of any pollutant in excess of these limits shall constitute a violation of the terms and conditions of this permit.

2. **Accidental Spill Prevention Plan**

To comply with Section 17.34.090 of the City Code, the permittee shall submit a new or revised Accidental Spill Prevention Plan (ASPP) to the Industrial Wastewater Management Section 90 days after the effective date of this permit. The plans shall include the following elements.

a. A description of the hazardous substances handled and their potential points of entry into the City sewer system or storm runoff

b. A description of the measures to be taken to prevent entry at the described points before a spill occurs

c. Measures to be taken to contain a spill if one occurs

d. A description of employee training in the prevention and control of spills

e. A posted notice informing employees of the requirement to notify the Bureau of Environmental Services in case of spills or uncontrolled discharges.

3. **Records Retention**

All records of monitoring activities and results, including all original strip chart recordings for continuous monitoring instrumentation (and calibration and maintenance records), shall be retained by the permittee for a minimum of three years. This retention period shall be extended during the course of any unresolved litigation pertaining to the discharge of pollutants by the permittee, or whenever it is requested by the City.

4. Monitoring (continued)

f. The permittee shall take all reasonable steps to minimize or correct any adverse impact to the POTW or the environment resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

g. If requested, the permittee shall provide or split discharge samples with the City of Portland Water Pollution Control Laboratory.

5. Reporting Requirements

a. Accidental or Slug Discharge

The permittee shall notify the City immediately, either in person or by telephone (323-3398), if accidental or slug discharge to the sanitary sewer occurs. A formal written report, discussing circumstances and remedies, shall be submitted to the City within 5 days of the occurrence.

b. Changes in Wastewater Characteristics

The permittee shall give notice to the Source Control Management Section 90 days before any facility expansion, production increase, or process modifications that result in new or substantially increased discharges or a change in the nature of the discharge.

c. Change in representative

If the responsible corporate official changes, notify the City within 10 days, as per 40CFR 403.12 (1) (4).

6. Upset

a. Definition:

For the purposes of this section, upset means an exceptional incident in which there is unintentional and temporary noncompliance with applicable pretreatment standards, because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

6. **Upset (continued)**

d. Burden of Proof

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset shall have the burden of proof.

e. Permittee Responsibility in Case of an Upset.

If reduction, loss, or failure of its treatment facility occurs, the permittee shall control production of all discharges in order to maintain compliance with applicable pretreatment standards until the facility is restored or an alternative method of treatment is provided. This requirement especially applies if the primary source of the treatment facility power is reduced, lost, or failed.

7. **Bypass or Diversion**

The diversion or bypass (the intentional diversion of wastestreams from any portion of a permittee's treatment facility) of any discharge, from facilities used by the permittee, to maintain compliance with the terms and conditions of this permit is prohibited except:

a. When unavoidable to prevent loss of life or severe property damage.

b. When excessive storm drainage or runoff would damage facilities necessary for compliance with the terms and conditions of this permit.

The permittee shall immediately notify the City in writing of each such diversion or bypass, in accordance with the procedure specified in condition No. 16.

11. **Permit Renewal**

This permit is issued to a specific entity and cannot be transferred by the industrial user and must be renewed pursuant to Section 17.34.070 of the Code of the City of Portland and Permit Applications must be received 90 days prior to:

a. Expiration date of current permit.

b. In the event the permittee plans to cease operations at the present location, and plans to relocate within the City of Portland's jurisdiction and continue the same permitted activities.

c. The permitted industrial process being significantly altered or changed so that pollutants not specifically mentioned in the current permit are present in the permittee's discharge.

12. **Plant Closure**

In the event the permittee plans to cease operations at the present business location, and not to relocate within the City of Portland's jurisdiction, the permittee shall inform this office, in writing, 90 days prior to plant closure.

13. **Appeal**

The permittee may request reconsideration of the terms of this permit within thirty (30) days of the effective date. This request must be in writing; failure to submit a request for reconsideration shall be deemed a waiver of the appeal.

17. **Continuous Compliance**

Compliance with Schedule E, No. 16 shall not relieve the permittee from responsibility to maintain continuous compliance with the conditions of this permit.

18. **Inspection and Entry**

The permittee shall, at all reasonable times, allow authorized representatives of the City:

a. To enter the permittee's premises where an effluent source or disposal system is located or where any records associated with this permit are kept.

b. To have access to any required records and permission to copy these records. At no time can wastewater effluent data be claimed or held as confidential information.

c. To inspect and evaluate any monitoring equipment or monitoring methods required by this permit.

d. To sample any discharge to the sewer system.

19 **Certification**

Legible copies of all applications, reports, and information submitted to the City shall be signed and certified as follows in accordance with 40CFR 403.12.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

23. Hazardous Waste Notification

The industrial user shall notify the Source Control Management Section, the POTW, the EPA Regional Waste Management Division Director, and State hazardous waste authorities in writing of any discharge into the POTW of a substance, which, if otherwise disposed of, would be a hazardous waste under 40CFR Part 261. Such notification must include the name of the hazardous waste as set forth in 40CFR Part 261, the EPA hazardous waste number, and the type of discharge (continuous, batch, or other). If the industrial user discharges more than 100 kilograms of such waste per calendar month to the POTW, the notification shall also contain the following information to the extent such information is known and readily available to the industrial user: an identification of the hazardous constituents contained in the wastes, an estimation of the mass and concentration of such constituents in the wastestream discharged during that calendar month, and an estimation of the mass of constituents in the wastestream expected to be discharged during the following 12 months.

Appendix 1
DEFINITIONS

Abbreviations

BOD_5	Five-day biochemical oxygen demand
mg/L	Milligrams per liter
kg	Kilograms
m^3/d	Cubic meters per day
ppm	Parts per million (assumed equal to milligrams per liter)
POTW	Publicly owned treatment works
WPCL	Water Pollution Control Laboratory

Averages for BOD, TSS, and chemical parameters are based on arithmetic mean of samples taken.

Definitions

Bypass

The intentional diversion of wastestreams from any portion of a permittee's treatment facility..

Compatible Pollutant

Biochemical oxygen demand, suspended solids, pH and fecal coliform bacteria, and additional pollutants that the City treatment works is designed to treat.

Conventional Pollutants

Classification of industrial pollutants, which includes BOD (biochemical oxygen demand), suspended solids, fecal coliform, pH (acidity/alkalinity), and other pollutants so designated by EPA, as defined by Section 304(a)(4) of the Clean Water Act.

Director of Environmental Services

The Director of Environmental Services of the City of Portland, Oregon, or that person's duly authorized representative or agent.

City, or City of Portland

The municipality of Portland, Oregon, a municipal corporation of the State of Oregon, acting through the City Council or any board, committee, body, official, or person to whom the Council shall have lawfully delegated the power to act on behalf of the City. Unless a particular board, committee, official, or person is specifically designated in these rules and regulations, wherever action by the City is explicitly required or implied herein, it shall be understood to mean action by the Director of Environmental Services of Portland, Oregon, or that person's duly authorized representative or agent.

Effective Date of this Permit

The date this permit is signed by the Director of the Bureau of Environmental Services.

Expiration Date

From 1 to 5 years beyond the effective date of this permit.

Hazardous or toxic substances

Hazardous or toxic substances are those substances referred to in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S. Code 9601 et seq.), section 502(13) of the Clean Water Act, and any other substances so designated by the Director of Environmental Services and contained in rules adopted pursuant to this Chapter.

Industrial Waste

Any liquid, solid, or gaseous substance (or combination thereof) resulting from any process of industry, manufacturing, commercial food processing, business, agriculture, trade, or research, including but not limited to the development, recovery, or processing of natural resources and leachate from landfills or other disposal sites.

Industrial Wastewater Discharge Permit

A permit to discharge industrial wastewater into the City sewer system issued under the authority of the City Code, which prescribes certain discharge requirements and limitation.

Interference

Interference means a discharge which, alone or in conjunction with a discharge or discharges from other sources, inhibits or disrupts the normal operation of the City sewer system, or which causes a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or any increase in the cost of treatment of sewage or in the cost of sewage sludge use or disposal incompliance with the following statutory provisions and regulations or permits issued thereunder
(or more stringent State or local regulations); Section 405 of the Clean Water Act, the Solid Waste Disposal Act (including Title II, more commonly referred to as the Resource Conservation and Recovery Act), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of RCRA, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Maximum Daily Discharge Limitation

The highest allowable daily discharge.

Nonconventional Pollutants

All pollutants that are not specifically designated as either conventional or toxic.

Oil and Grease

Fats, Oils and Grease. Fats, oils and grease are those substances which are measured by Standard Methods, current edition, freon extraction Method 5520B.

(a) Non-polar fats, oils and grease are that portion of fats, oils and grease which is measured as non-polar (from petroleum sources) by Standard Methods, current edition, Method 5520F.

(b) Polar fats, oils and grease are that portion of fats, oils and grease which is determined to be polar (of animal or vegetable origin) by Standard Methods, current edition, Method 5520F.

Pass Through

Pass through means a discharge which exits the POTW into waters of the United States in Quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

POTW

POTW means Publicly Owned Treatment Works, which includes any devices and systems, owned by a State or municipality, used in the collection, transportation, storage, treatment, recycling and reclamation of wastewater.

Pretreatment

The reduction of the amount of pollutants, the elimination of pollutants, or the alternation of the nature of pollutant properties in wastewater to a non-harmful state, prior to or in lieu of discharge of such pollutants into the City sewer system.

Sampling

a. The "monthly average" other than pH is the arithmetic mean of samples collected curing a calendar month.

b. The "daily maximum" is defined as the greatest allowable value for any calendar day.

c. A "24-hour composite" sample shall mean a flow-proportioned mixture of not less than eight discrete aliquots. Each aliquot shall be a grab sample of not less than 100 ml and shall be collected and preserved in accordance with 40 CFR part 136 and amendments.

d. A "Grab" sample is an individual sample collected in less than 15 minutes, without regard for flow or time.

e. A "Grab-Composite" is a minimum of four grab samples collected and preserved over a 24-hour period and combined to provide a representative sample of effluent being discharged.

Schedule of Compliance

A schedule of remedial measures, including an enforceable sequence of actions or operations leading to compliance with an effluent limitation or other limitation, prohibition, or standard.

Severe Property Damage

Substantial physical damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

Slugload

A slugload is any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge.

Solid Waste

Any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits.

Solid Waste Disposal

The final placement of refuse that cannot be salvaged or recycled.

Solvent Management Plan

A plan that specifies the toxic organic compounds used, the method of disposal used (instead of dumping into wastestreams), and procedures for ensuring that toxic organics do not spill or leak into wastewater discharged to the City sewer system.

Total Dissolved Solids

The total dissolved (filterable) solids as determined by use of the method specified in the list of approved test procedures.

Total Organic Active Ingredients

The sum of all organic active ingredients covered by the organic pesticide chemicals manufacturing subcategory, which are manufactured at a facility subject to the effluent guidelines for pesticides chemicals manufacturing.

Total Solids

The sum of dissolved and undissolved constituents in water or wastewater, usually expressed as milligrams per liter.

Total Suspended Solids

Total suspended matter that either floats on the surface or is in suspension in water or wastewater and that are removable by laboratory filtering (as described in *Standard Methods for the Examination of Water and Wastewater*, current edition) or Guidelines Establishing Test Procedures for the analysis of Pollutants, contained in 40 CFR 136, as published in the *Federal Register*.(Bureau of Environmental Services Administrative Rules I[22])

Upset

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with applicable pretreatment standards, because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Waste

Unwanted materials left over from manufacturing processes, or refuse from places of human or animal habitation.

Wastewater

Industrial waste, sewage, or any other waste, including that which may be combined with any groundwater, surface water, or stormwater that may be discharged to the city sewer system.

Water Pollution

The addition of enough harmful or objectionable material to damage water quality.

SAMPLING LOCATION MAP

SAMPLING MANHOLE MAP

INDUSTRIAL WASTEWATER MANAGEMENT

CITY OF PORTLAND, OREGON

DEPT OF PUBLIC WORKS

OFFICE OF THE CITY ENGINEER

CHEMAX MANUFACTURING

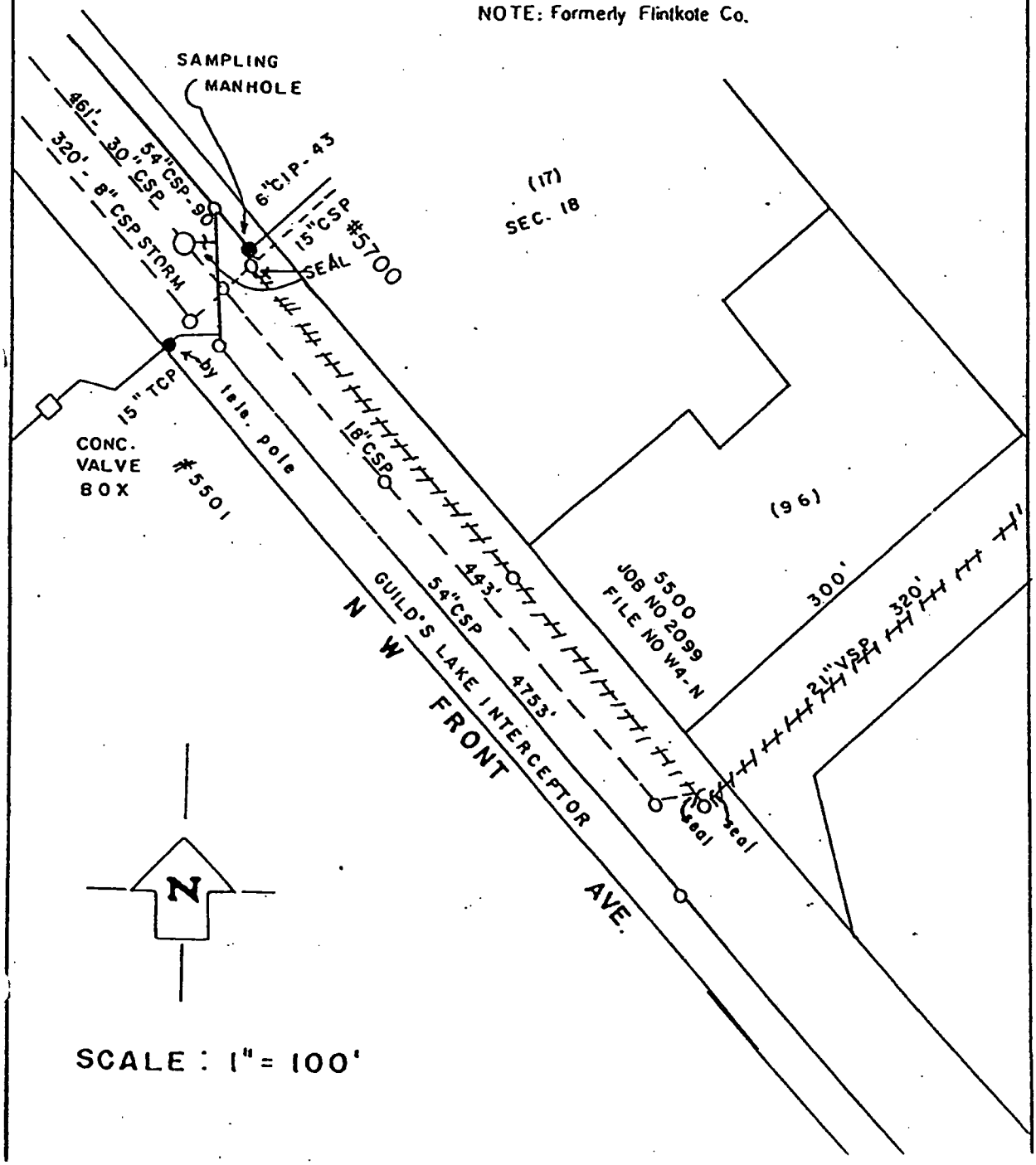
5700 NW FRONT AVE

PORTLAND, OR. 97210

SIC 2899 1/4 SEC. 2523 DATE 1/31/78

MISC. CHEMICAL PRODUCTS

NOTE: Formerly Flintkote Co.



SCALE : 1" = 100'

RESERVED

**Spill Prevention and Control Plan
to be prepared by the Permittee
and approved by the City.**

CITY OF PORTLAND
INDUSTRIAL DISCHARGE REPORT

INDUSTRY NAME:	CHEMAX		(FOR CITY USE ONLY)
PERMIT NUMBER:	400-060	REPORT TYPE (CHECK ONE)	
REPORT DUE DATE:		☐ INITIAL MONITORING	
SAMPLING PERIOD:		☐ PERIODIC COMPLIANCE	
SAMPLE CODE:		☐ SPECIAL COMPLIANCE	
TODAY'S DATE:		☐ _____	

SAMPLE DATE >		SAMPLE LOCATION >		SAMPLE TYPE >	_ COMPOSITE _ GRAB	DATE RECEIVED AT LAB >		DATE OF SAMPLE ANALYSIS >	

PARAMETER	CODE	REPORTED CONCENTRATION mg/L	LIMIT mg/l daily	LIMIT mg/l monthly	VIOLATION YES(X)	VIOLATION LEVEL	COMMENTS
AMMONIA	707		50 mg/L				
SULFATE	854		500 mg/L				

certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the erson or persons who manage the system, or those persons directly responsible for gathering the information, the information submi, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitt information, including the possibility of fine and imprisonment for knowing violations.

Signature:_____ Date:_____

APPENDIX J

GWCC PORTLAND BRANCH FACILITY INSPECTION FORMS

ENVIRONMENTAL SWEEP SHEET

BRANCH _____ MONTH _____

DAY/TIME	CONDUCTED BY	SPILL RELEASE NOTED	ACTION TAKEN
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

ADDITIONAL COMMENTS:

DATE_____ BY_____

_____

CHECK	
	LOADING RACK
_____	Acid Side Pumped
_____	Water hose off
_____	Samples Collected
_____	Hoses Disconnected
	DRUMMING SHED
_____	Acid Side Washed Down and Pumped out at end of shift
_____	Solvent Manifold Secured (Valves Not Dripping)
_____	Yellow Chains Up
_____	Samples Collected
_____	Empty Garbages (Nightly)
	TANK-FARM
_____	Clean
_____	Hoses Disconnected
_____	All Valves Closed
_____	Airpumps In Place
_____	Manifolds Secure (Valves Not Dripping)
_____	No Valves or lines leaking
_____	No Retain In Buckets
	RAIL RACK
_____	Cars Disconnected
_____	Blue Sign Down
_____	Placards Turned on Empty Cars
_____	Compressor Switched to "AUTO"

GREAT WESTERN CHEMICAL COMPANY

MONTHLY SAFETY INSPECTION CHECKLIST

BRANCH:_____
DATE INSPECTED:_____
LAST INSPECTED:_____
CONDUCTED BY:_____
_____

REMEDIAL:
1. Report and remedy dangerous conditions immediately.
2. Send completed form to Darryl Mollenhauer.
3. Retain copy of completed form in a binder at your branch.

WAREHOUSE: (including warehouse, office, lockers & breakrooms)

A. Housekeeping	Yes	No	Date Tested/ Inspected	Date to Remedy	Remarks
1. No excess accumulation of trash or combustible material			N/A		
2. Aisles unobstructed			N/A		
3. Floor clean, surface in "NO SLIP" condition and free of holes & breaks			N/A		
4. Lighting sufficient for work being performed			N/A		
5. Stairs unobstructed, treading and handrails in good repair			N/A		
6. Electrical cords in proper condition, do not pose trip hazard			N/A		
7. Pallets in good repair and stored properly			N/A		
8. Electrical panels accessible; no combustibles stored within 3 ft.			N/A		
9. Drainage good; no water accumulation			N/A		
10. Employee workplace clean and orderly			N/A		
B. Work Practices					
1. Equipment guards in place			N/A		
2. Employee's wearing eye protection and steel toed shoes			N/A		
3. Smoking and eye protection rules posted			N/A		

	Yes	No	Date Tested/ Inspected	Date to Remedy	Remarks
C. Material Storage					
1. Products stacked/stored in safe manner			N/A		
2. Warmroom operating properly (temp)			N/A		
3. Damaged product segregated			N/A		
4. Foodgrade product segregated			N/A		
5. Torn sacks/leaked repaired or segregated			N/A		
6. All products labeled and stored properly (Flammables outside, oxidizers not with corrosives, ect.)			N/A		
7. Flammables not stored within 50 ft. of warehouse			N/A		
D. Fire Protection					
1. All automatic sprinkler valves secured open			N/A		
2. Fire hoses in good condition and accessible					
3. Fire exits unobstructed and clearly marked			N/A		
4. Fire extinguishers: mounted, charged and inspected					
5. Fire extinguishers on forklifts					
E. Safety Equipment					
1. Spill control station equipped			N/A		
2. First Aid kit fully equipped			N/A		
3. Eyewash / shower tested monthly					
4. Blankets available			N/A		
5. Chlorine kit fully equipped			N/A		
6. Wheel chocks available at dock, loading rack and yard			N/A		
F. Compressed Gas					
1. 100-150 lb. cylinders stored upright with protective caps and chained in place			N/A		
2. Empty and full cylinders separated			N/A		
3. Cylinders not exposed to extreme heat or standing water			N/A		
4. Chlorine cylinders not stored with other compressed gas			N/A		
5. Chlorine emergency kit complete			N/A		
6. Appropriate materials handling equipment available			N/A		
7. SCBA ready for use					

G. Tankfarm	Yes	No	Date Tested/ Inspected	Date to Remedy	Remarks
1. Tanks and manifolds labels complete and legible			N/A		
2. Berms in good condition			N/A		
3. Hoses in good condition and stored properly			N/A		
4. No visible signs of leaks (valves, tanks, ect.)			N/A		

APPENDIX K

GWCC TEST BORING AND WELL LOGS

LOG OF EXPLORATORY BORING

PROJECT NAME	CHEMAX	BORING NO.	CHEM- 1
LOCATION	Portland, Oregon	PAGE	1 OF 1
DRILLED BY	GeoTech Explorations	REFERENCE ELEV.	'±
DRILL METHOD	H.S. Auger	TOTAL DEPTH	21.50'
LOGGED BY	A. Coates	DATE COMPLETED	6/12/90

SAMPLE NUMBER (SAMPLE TYPE)	RECOVERY PERCENT (%)	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								0-21.5' SAND (SM), medium brown, trace white, 30% non-plastic fines, 70% fine sand, trace fine subrounded to subangular gravel, loose to compact, moist to wet.
#1 (SS)	86%	12-13-12 (25)						
#2 (SS)	100%	4-7-5 (12)		5				
#3 (SS)	86%	2-4-5 (9)						
#4 (SS)	73%	2-3-3 (6)		10				
#5 (SS)	67%	4-2-5 (7)						
#6 (SS)	80%	2-5-7 (12)	▽ 16.00' 6-12-90	15				
#7 (SS)	80%	10-13-12 (25)						
#8 (SS)	100%	2-5-7 (12)		20				@ 21 feet, trace wood debris.
								Bottom of borehole at 21.5 feet.
				25				

REMARKS

(SS) = Split spoon sample. Borehole backfilled with bentonite chips and topped with asphalt patch. Sample at depth 5-6.5 feet was named CHEM-1A, sample at depth 15-16 feet was named CHEM-1B.

LOG OF EXPLORATORY BORING

PROJECT NAME	CHEMAX	BORING NO.	MW-1
LOCATION	Portland, Oregon	PAGE	1 OF 1
DRILLED BY	GeoTech Explorations	REFERENCE ELEV.	±'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	21.50'
LOGGED BY	A. Coates	DATE COMPLETED	6/13/90

SAMPLE NUMBER (SAMPLE TYPE)	RECOVERY PERCENT (%)	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								0-21.5' SAND (SM), medium brown, trace white, 30% non-plastic fines, 70% fine sand, trace fine subrounded to subangular gravel, loose to compact, moist to wet.
#1 (SS)	93%	2-3-4 (7)		5				
#2 (SS)	86%	4-2-3 (5)						@ 7-8 feet, trace fine to coarse subrounded to subangular gravel.
#3 (SS)	100%	2-3-3 (6)		10				
#4 (SS)	100%	5-6-11 (17)	▽ 16.00' 6-12-90	15				
#5 (SS)	80%	2-2-2 (4)		20				
								Bottom of borehole at 21.5 feet.
				25				

REMARKS

(SS) = Split spoon sample. Sample at depth 5-6.5 feet was named CHEM-2A, sample at depth 15-16 feet was named CHEM-2B.

LOG OF EXPLORATORY BORING

PROJECT NAME CHEMAX
LOCATION Portland, Oregon
DRILLED BY GeoTech Explorations
DRILL METHOD Hollow Stem Auger
LOGGED BY C. Hultgren

BORING NO. MW- 2
PAGE 1 OF 2
REFERENCE ELEV. ±
TOTAL DEPTH 28.00'
DATE COMPLETED 10/1/93

SAMPLE NUMBER SAMPLE TYPE		BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								0-1.5 feet: ASPHALT.
1 SS		5-6-6-9						1.5-1.9 feet: SAND (SP), light brown, fine to medium sand, trace fines, medium dense, moist.
								1.9-2.1 feet: SILTY SAND (SM), light brown, >66% fine sand, <33% low plastic fines, medium dense, moist.
								2.1-2.4 feet: SAND (SP), as above.
				5				2.4-2.7 SILTY SAND (SM), as above.
2 SS		2-3-2						2.7-3.2 feet: SAND (SP), as above.
								3.2-3.5 feet: NO RECOVERY.
								5.0-5.4 feet: SILTY SAND (SM), as above, loose, moist.
								5.4-6.3 feet: SAND (SP), as above, loose, moist.
								6.3-6.5 feet: NO RECOVERY.
3 SS		2-1-2		10				10.0-11.3 feet: SAND (SP), brown, fine to medium sand, trace fines, up to 10% fine subangular to subrounded gravels, loose, moist.
								11.3-11.5 feet: NO RECOVERY.
4 SS		3-4-4		15				15.0-16.5 feet: SAND (SP), brown, fine to medium sand, trace fines, loose, shoe of split spoon sampler wet at 16.5 feet.
			▽ 17.2' 10-1-93 1255					
				20				

REMARKS

1) SS = Split spoon sample.

EMCON Northwest, Inc.

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LOG OF EXPLORATORY BORING

PROJECT NAME CHEMAX
LOCATION Portland, Oregon
DRILLED BY GeoTech Explorations
DRILL METHOD Hollow Stem Auger
LOGGED BY C. Hultgren

BORING NO. MW- 2
PAGE 2 OF 2
REFERENCE ELEV. ±
TOTAL DEPTH 28.00'
DATE COMPLETED 10/1/93

SAMPLE NUMBER SAMPLE TYPE		BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
5 SS		1-1-2						20.0-20.8 feet: SAND (SP), gray, fine to medium sand, <10% fines, very loose, wet.
								20.8-21.0 feet: SILTY CLAY (CL), gray, medium plastic, soft, wet.
								21.0-21.1 feet: SAND (SP), as above.
								21.1-21.5 feet: NO RECOVERY.
6 SS		2-3-3-5		25				25.0-26.9 feet: SAND (SP), as above, wet.
								26.9-27.0 feet: NO RECOVERY.
								Bottom of boring at 28.0 feet below ground surface.
								WELL COMPLETION DETAILS:
								0.28 to 17.49 feet: 2-inch-diameter, Schedule 40 PVC riser pipe.
								17.49-27.06 feet: Johnson prepacked (20-40 Colorado silica sand) 0.012-inch slotted screen interval.
								27.06 to 27.75 feet: 2-inch-diameter Schedule 40 PVC sump.
								Sherwood traffic grade flush mount.
								0 to 1.5 feet: Concrete.
								1.5 to 15.5 feet: Bentonite chips hydrated with potable water.
								15.5 to 27.75 feet: 10-20 Colorado silica sand.
								27.75 to 28.0 feet: Heave.
				30				
				35				
				40				

REMARKS

1)SS = Split spoon sample.

EMCON Northwest, Inc.

LOG OF EXPLORATORY BORING

PROJECT NAME CHEMAX
LOCATION Portland, Oregon
DRILLED BY GeoTech Explorations
DRILL METHOD Hollow Stem Auger
LOGGED BY C. Hultgren

BORING NO. MW- 3
PAGE 1 OF 2
REFERENCE ELEV. ±
TOTAL DEPTH 27.52'
DATE COMPLETED 10/4/93

SAMPLE NUMBER SAMPLE TYPE		BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								0-0.5 feet: ASPHALT.
								0.5-1.7 feet: SANDY GRAVEL (GW), dark gray, 70% fine to coarse subangular to angular gravels, <30% fine to coarse sand, dense, damp. (ROAD BASE)
1 SS		6-8-8-8						1.7-3.2 feet: SAND (SP), light brown, fine to medium sand, trace fines, medium dense, damp.
								3.2-3.5 feet: NO RECOVERY.
2 SS		2-2-3		5				5.0-5.7 feet: SAND (SP), brown, fine to medium sand, trace fines, medium dense, damp.
								5.7-6.5 feet: NO RECOVERY.
3 SS		2-2-2		10				10.0-11.2 feet: SAND (SP), brown, fine to medium sand, trace fines, medium dense, damp.
4 SS		2-3-4		15				15.0-16.3 feet: SANDY (SP), brown, fine to medium sand, trace fines, medium dense, moist.
								@ 18.0 feet: drilling change, became softer.
				20				

REMARKS

1)SS = Split Spoon Sample.

EMCON Northwest, Inc.

LOG OF EXPLORATORY BORING

PROJECT NAME CHEMAX
LOCATION Portland, Oregon
DRILLED BY GeoTech Explorations
DRILL METHOD Hollow Stem Auger
LOGGED BY C. Hultgren

BORING NO. MW-3
PAGE 2 OF 2
REFERENCE ELEV. ±
TOTAL DEPTH 27.52'
DATE COMPLETED 10/4/93

SAMPLE NUMBER SAMPLE TYPE		BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
5 SS		3-4-5						20.0-20.9 feet: SAND (SP), gray, fine to medium sand, up to 10% fines, loose, wet.
								20.9-21.0 feet: CLAYEY SILT (ML), gray, medium plastic, soft, wet.
								21.0-21.3 feet: SAND (SP), gray, fine to medium sand, up to 10% fines, loose, wet.
								21.3-21.5 feet: NO RECOVERY.
6 SS		1 for 1.5'		25				25.0-25.9 feet: CLAYEY SILT (ML), gray, medium plastic, soft, wet.
								Bottom of boring at 27.5 feet below ground surface.
								WELL COMPLETION DETAILS:
								0.68-17.26 feet: 2-inch Schedule 40 PVC riser pipe.
								17.26-26.82 feet: Johnson prepacked (20-40 Colorado silica sand) 0.012-inch slotted screen interval.
								26.82-27.52 feet: 2-inch Schedule 40 PVC sump.
								Sherwood traffic grade flush mount.
								0-1.5 feet: Concrete.
								1.5-15.0 feet: Bentonite chips hydrated with potable water.
								15.0-27.5 feet: 10-20 Colorado silica sand.
				30				
				35				
				40				

REMARKS

1) SS = Split Spoon Sample.

EMCON Northwest, Inc.

LOG OF EXPLORATORY BORING

PROJECT NAME CHEMAX
LOCATION Portland, Oregon
DRILLED BY GeoTech Explorations
DRILL METHOD Hollow Stem Auger
LOGGED BY C. Hultgren

BORING NO. MW- 4
PAGE 1 OF 2
REFERENCE ELEV. ±
TOTAL DEPTH 28.22'
DATE COMPLETED 10/1/93

SAMPLE NUMBER SAMPLE TYPE		BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
1 SS		4-5-4-6						1.0-2.7 feet: SAND (SP), light brown, fine to medium sand, trace fines, loose, moist.
								2.7-3.0 feet: NO RECOVERY.
2 SS		3-2-3		5				5.0-5.8 feet: SAND (SP), light brown, fine to medium sand, trace fines, loose, red staining from 6.35 to 6.80 feet, moist.
								5.8-6.1 feet: SAND (SW), fine to coarse sand, local trace fine subangular gravels, moist.
								6.1-6.5 feet: NO RECOVERY.
3 SS		3-3-4		10				10.0-11.0 feet: SAND (SP), brown, fine to medium sand, trace 20% fines, loose, moist.
								11.0-11.5 feet: NO RECOVERY.
4 SS		3-3-2		15				15.0-15.9 feet: SAND (SP), brown, fine to medium sand, trace 20% fines, loose, wet at approximately 16.5 feet (drive shoe on split spoon sampler wet).
			▽ 17.4' 9-30-93 0935					15.9-16.5 feet: NO RECOVERY.
				20				

REMARKS

1)SS = Split Spoon Sample.

EMCON Northwest, Inc.

LOG OF EXPLORATORY BORING

PROJECT NAME CHEMAX
LOCATION Portland, Oregon
DRILLED BY GeoTech Explorations
DRILL METHOD Hollow Stem Auger
LOGGED BY C. Hultgren

BORING NO. MW- 4
PAGE 2 OF 2
REFERENCE ELEV. ±
TOTAL DEPTH 28.22'
DATE COMPLETED 10/1/93

SAMPLE NUMBER SAMPLE TYPE		BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
5 SS		1-1-1-3						20.0-20.9 feet: SAND (SP), gray, 85-90% fine to medium sand, 10-15% fines, very loose, wet.
								20.9-21.25 feet: SANDY SILT (ML), gray, >60% low plastic fines, <40% fine sand, soft, wet.
								21.25-22.0 feet: SILTY SAND (SM), gray, 60-70% fine sand, 30-40% low plastic fines, soft, wet.
				25				
6 SS		0-1-1						25.0-25.5 feet: SAND (SW), gray, fine to coarse sand, very loose, wet.
								25.5-26.2 feet: CLAYEY SILT (ML), gray, medium plastic, soft, wet.
								26.2-26.5 feet: NO RECOVERY.
								Bottom of boring at 28.22 feet below ground surface.
								WELL COMPLETION DETAILS:
								0.50-17.96 feet: 2-inch Schedule 40 PVC riser.
								17.96-27.53 feet: Johnson prepacked (20-40 Colorado silica sand) 0.012-inch slotted screen interval.
								27.53-28.22 feet: 2-inch Schedule 40 PVC sump.
								Sherwood traffic grade flush mount.
								0-1.5 feet: Concrete.
								1.5-16.0 feet: Bentonite chips hydrated with potable water.
								16.0-28.22 feet: 10-20 Colorado silica sand.
				30				
				35				
				40				

REMARKS

1)SS = Split Spoon Sample.

EMCON Northwest, Inc.

LOG OF EXPLORATORY BORING

PROJECT NAME CHEMAX
LOCATION Portland, Oregon
DRILLED BY GeoTech Explorations
DRILL METHOD Hollow Stem Auger
LOGGED BY C. Hultgren

BORING NO. MW- 5
PAGE 1 OF 3
REFERENCE ELEV. ±
TOTAL DEPTH 35.50'
DATE COMPLETED 9/30/93

SAMPLE NUMBER SAMPLE TYPE		BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
1 SS		8-9-12						1.0-1.2 feet: SILTY SAND (SM), brown, 70% fine sand, 30% fines, medium dense, trace fine angular gravels, moist. 1.2-2.2 feet: SAND (SW), brown, >90% fine to coarse sand, <10% fines, medium dense, moist, some green and red colored grains and local red and white staining. (paint or product?) 2.2-2.5 feet: NO RECOVERY.
2 SS		2-1-1		5				5.0-5.4 feet: SAND (SW), light brown, 80% fine to coarse sand, 20% low plastic fines, local red staining (paint or product?), very loose, moist. 5.4-6.0 feet: SAND (SP), light brown, fine to medium sand, trace fines, very loose, moist. 6.0-7.5 feet: NO RECOVERY.
3 SS		3-2-3		10				10.0-11.5 feet: SAND (SP), light brown, fine to medium sand, trace fines, very loose, moist.
4 SS		2-3-4		15				15.0-16.5 feet: SAND (SP), light brown, fine to medium sand, trace fines, very loose, moist. Note: drilling change at 18.0 feet, became softer.
				20				

REMARKS

1)SS = Split Spoon Sample.

LOG OF EXPLORATORY BORING

PROJECT NAME CHEMAX
LOCATION Portland, Oregon
DRILLED BY GeoTech Explorations
DRILL METHOD Hollow Stem Auger
LOGGED BY C. Hultgren

BORING NO. MW- 5
PAGE 2 OF 3
REFERENCE ELEV. ±
TOTAL DEPTH 35.50'
DATE COMPLETED 9/30/93

SAMPLE NUMBER SAMPLE TYPE	BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
5 SS	1 for 1.5'						20.0-20.05 feet: SAND (SW), gray, fine to coarse, very loose, very moist.
							20.05-21.5 feet: CLAYEY SILT (ML), gray, medium plastic fines, very soft, moist to wet.
6 SS	1 for 1.5'		25				25.0-26.5 feet: CLAYEY SILT (ML), gray, medium plastic fines, very soft, moist to wet.
		▽ 26.4' 9-30-93 1500					
7 SS	1-1-1		30				30.0-30.4 feet: CLAYEY SILT (ML), gray, medium plastic fines, very soft, moist to wet.
							30.4-31.5 feet: SANDY SILT (ML), gray, 80% low plastic fines, 20% fine sand, soft, wet.
			35				Bottom of boring at 35.5 feet below ground surface.
							WELL COMPLETION DETAILS
							0.36-25.24 feet: 2-inch Schedule 40 PVC riser.
							25.24-34.81 feet: Johnson prepacked (20-40 Colorado silica sand) 0.012-inch slotted screen interval.
							34.81-35.50 feet: 2-inch Schedule 40 PVC sump.
							Sherwood traffic grade flush mount.
							0-1.5 feet: Concrete.
			40				

REMARKS

1)SS = Split Spoon Sample.

LOG OF EXPLORATORY BORING

PROJECT NAME **CHEMAX**
LOCATION **Portland, Oregon**
DRILLED BY **GeoTech Explorations**
DRILL METHOD **Hollow Stem Auger**
LOGGED BY **C. Hultgren**

BORING NO. **MW- 5**
PAGE **3 OF 3**
REFERENCE ELEV. **±**
TOTAL DEPTH **35.50'**
DATE COMPLETED **9/30/93**

SAMPLE NUMBER SAMPLE TYPE		BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO LOGIC COLUMN	LITHOLOGIC DESCRIPTION
				45				1.5-22.5 feet: Bentonite chips hydrated with potable water. 22.5-35.5 feet: 10-20 Colorado silica sand.
				50				
				55				
				60				

REMARKS

1)SS = Split Spoon Sample.

PRELIMINARY ASSESSMENT OF
McCALL OIL & CHEMICAL CORPORATION
AND
GREAT WESTERN CHEMICAL COMPANY

NW FRONT AVENUE PROPERTIES
PORTLAND, OREGON
ESCI ID #134
VOLUME 3 - APPENDIX L

Prepared for

McCall Oil and Chemical Corporation

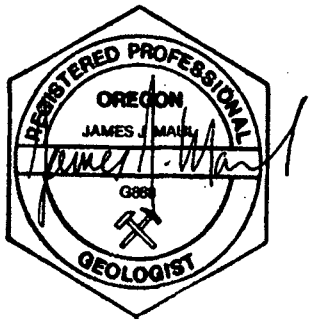
and

Great Western Chemical Company

April 5, 1994

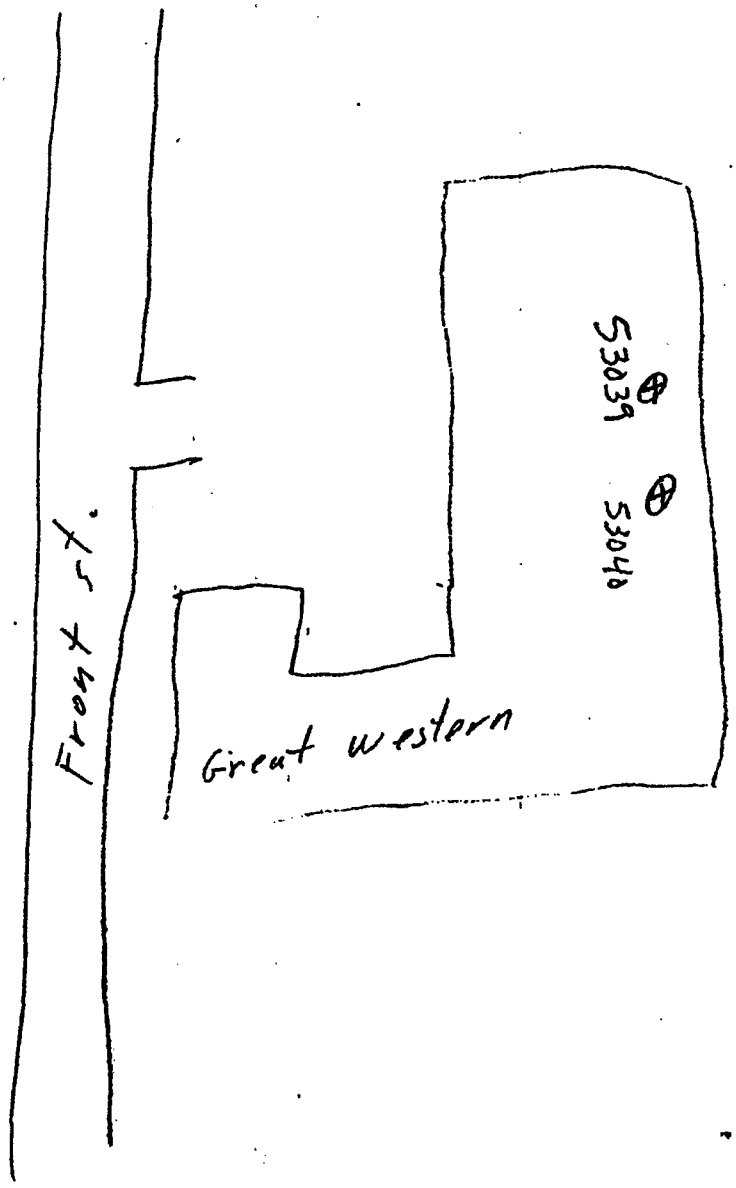
Prepared by

EMCON Northwest, Inc.
15055 SW Sequoia Parkway, Suite 140
Portland, Oregon 97224



Project 0234-003.01

SITE MAP



STATE OF OREGON
MONITORING WELL REPORT
(as required by ORS 537.765 & OR 690-240-095)

JUN - 2 1993
WATER RESOURCES DEPT.
SALEM, OREGON

Mult 3496

1N / 1E / 18

Start Card # 53039

(1) OWNER/PROJECT:

WELL NO.

Name Great Western Chemical Co

Address 7700 NW Front

City PTld State OR Zip 97210

(2) TYPE OF WORK:

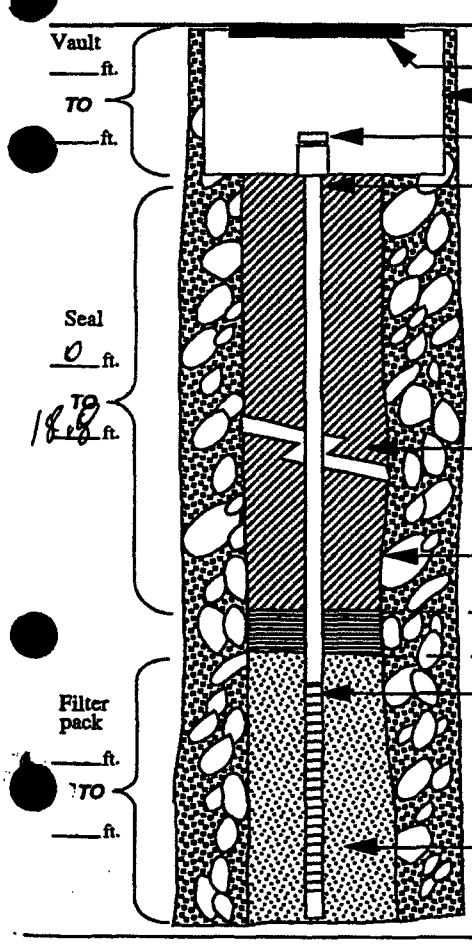
☒ New construction ☐ Repair ☐ Recondition
☐ Conversion ☐ Deepening ☒ Abandonment

(3) DRILLING METHOD

☐ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Hollow Stem Auger ☐ Other Well point

(4) BORE HOLE CONSTRUCTION

Special Standards Yes ☑ No ☐ Depth of completed well 18.8 ft.



(5) WELL TEST:

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Permeability Yield GPM

Conductivity PH

Temperature of water 55 °F/C Depth artesian flow found ft.

Was water analysis done? ☒ Yes ☐ No

By whom? Emcon

Depth of strata to be analyzed. From 16.8 ft. to 18.8 ft.

Remarks:

Name of supervising Geologist/Engineer

(6) LOCATION OF WELL By legal description

Well Location: County Mult

Township 1N (N or S) Range 1E (E or W) Section 18

1. SW 1/4 of SW 1/4 of above section.
2. Street address of well location Same
3. Tax lot number of well location N/A
4. ATTACH MAP WITH LOCATION IDENTIFIED.

(7) STATIC WATER LEVEL:

16.8 Ft. below land surface. Date 5/16/93

Artesian Pressure lb/sq. in. Date

(8) WATER BEARING ZONES:

Depth at which water was first found 16.8

From	To	Est. Flow Rate	SWL

(9) WELL LOG:

Ground elevation

Material	From	To	SW
Sand	10	18.8	

RECEIVED
JUL 6 1993
WATER RESOURCES DEP
SALEM, OREGON

Date started 5/16 Completed 5/16

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed William Cobb MWC Number 106
Date 5/6/93

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed Gary Mimmo MWC Number 106
Date 6/11/93

JUN - 2 1993

STATE OF OREGON
MONITORING WELL REPORT
(as required by ORS-537.765 & OAR 690-240-095)

WATER RESOURCES DEPT. SALEM, OREGON

MULT 3497 — 1N/1E/18C

Start Card # 53040

(1) OWNER/PROJECT:

WELL NO.

Name Great Western Chemical Co.

Address 5700 NW Front #7

City Pdx State OR Zip 97210

(2) TYPE OF WORK:

- [X] New construction
- [ ] Repair
- [ ] Recondition
- [ ] Conversion
- [ ] Deepening
- [X] Abandonment

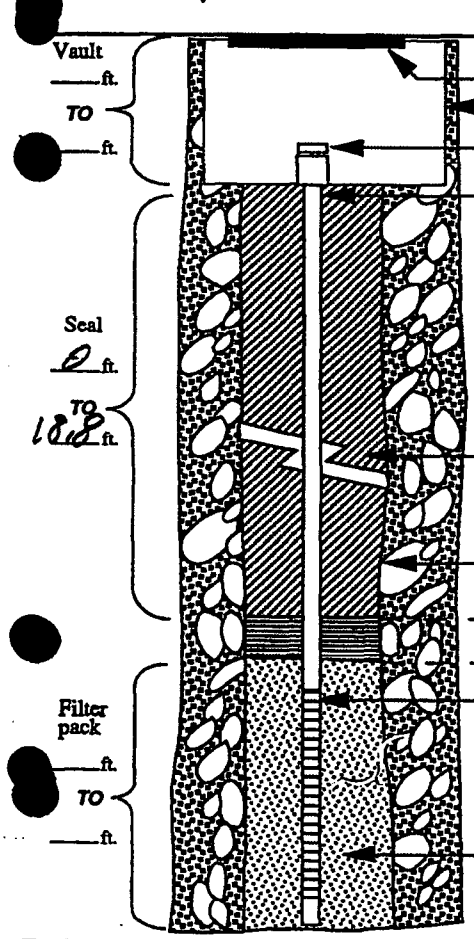
(3) DRILLING METHOD

- [ ] Rotary Air
- [ ] Rotary Mud
- [ ] Cable
- [ ] Hollow Stem Auger
- [ ] Other well point

(4) BORE HOLE CONSTRUCTION

Special Standards Yes [X] No [ ]

Depth of completed well 18.8 ft.



(5) WELL TEST:

- [ ] Pump
- [ ] Bailer
- [ ] Air
- [ ] Flowing Artesian

Permeability _____ Yield _____ GPM

Conductivity _____ PH _____

Temperature of water 57 °F/C Depth artesian flow found _____ ft.

Was water analysis done? [X] Yes [ ] No

By whom? Em Con

Depth of strata to be analyzed. From 16.8 ft. to 18.8 ft.

Remarks: boring with water sample -0

Name of supervising Geologist/Engineer _____

(6) LOCATION OF WELL By legal description

Well Location: County Mult

Township 1N (N or S) Range 1E (E or W) Section 18

1. SW 1/4 of SW 1/4 of above section.
2. Street address of well location same
3. Tax lot number of well location N/A
4. ATTACH MAP WITH LOCATION IDENTIFIED.

(7) STATIC WATER LEVEL:

16.8 Ft. below land surface. Date 5/6/93

Artesian Pressure _____ lb/sq. in. Date _____

(8) WATER BEARING ZONES:

Depth at which water was first found 16.8

From	To	Est. Flow Rate	SWL

(9) WELL LOG:

Ground elevation _____

Material	From	To	SWL
Sand	8	18.8	

RECEIVED
JUL - 6 1993
WATER RESOURCES DEPT.
SALEM, OREGON

Date started 5/6 Completed 5/6

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed William Cobb MWC Number 100 Date 5/6/93

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number 100

Signed _____ Date 6/1/93

APPENDIX L

SOIL CLEANUP AND GROUNDWATER MONITORING REPORT GREAT WESTERN CHEMICAL COMPANY - TECHNICAL CENTER FACILITY

GREAT WESTERN CHEMICAL COMPANY

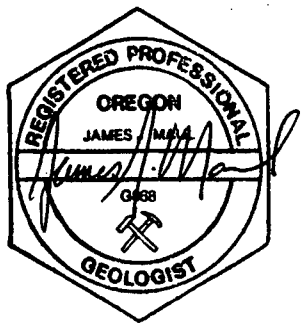
TECHNICAL CENTER FACILITY
5700 NW Front Avenue
Portland, Oregon

SOIL CLEANUP AND GROUNDWATER MONITORING REPORT

Prepared for

Great Western Chemical Company

March 31, 1994



Prepared by

EMCON Northwest, Inc.
15055 SW Sequoia Parkway, Suite 140
Portland, Oregon 97224

Project 0235-010.03

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EXECUTIVE SUMMARY

Overview of Work Completed

At the advice of legal counsel, Great Western Chemical Company (GWCC) contracted with EMCON Northwest, Inc. (EMCON) for specific environmental services. EMCON coordinated a chromated copper arsenic (CCA) soil, debris, and groundwater assessment and cleanup at the GWCC Technical Center Facility (Facility) situated at 5700 NW Front Avenue, Portland, Oregon, formerly known as "Chemax."

Sampling and removal activities were conducted in a manner consistent with applicable Oregon Department of Environmental Quality (DEQ), U.S. Environmental Protection Agency (USEPA), and Occupational Health and Safety Administration (OSHA) standards. Remedial activities conducted at the Facility from December 1992 through April 1993 resulted in removal and disposal of approximately 139 tons of nonhazardous miscellaneous soil and debris (i.e., concrete, wood, iron rebar, and plastic) and 140 tons of soil and concrete, which were classified as a characteristic hazardous waste for arsenic and chromium (waste codes D004 and D007).

Work performed by EMCON from September 1992 to January 1994 was at the direction of legal counsel and consisted of the following activities:

- Visiting the Facility to observe site conditions
- Preparing sampling and analysis and health and safety plans
- Reviewing applicable regulatory soil and groundwater cleanup criteria
- Coordinating GWCC's remediation activities and the remedial work of waste disposal contractors and subcontractors
- Conducting preliminary and confirmatory sampling at the former CCA formulation area and characterizing the excavated soil and debris
- Sampling waste liquids generated during equipment decontamination

- Coordinating waste and debris disposal, including the profiling of the waste liquids and solids
- Supervising excavation and installation of groundwater monitoring wells
- Sampling groundwater quarterly, and measuring groundwater levels (ongoing)
- Evaluating groundwater analytical and hydrologic data (ongoing)
- Coordinating backfilling and capping of the excavation area
- Preparing this report

Findings

Soil

- Soil that exceeded target cleanup level concentrations was excavated, containerized, and disposed of at a Resource Conservation and Recovery Act (RCRA) treatment, storage, and disposal (TSD) facility or a RCRA Subtitle D lined solid waste landfill; except for pockets where excavation was precluded by potential structural damage to facility structures.
- The average concentrations of CCA constituents in remaining soil is below target cleanup levels.
- Based on the available information and a preliminary exposure evaluation, there is no threat to human health or the environment posed by constituents remaining in soil.

Groundwater

- The depth to groundwater below the Facility warehouse is approximately 17 feet, depending upon seasonal fluctuation. The uppermost saturated zone is a thin veneer of saturated dredge spoil sediments, overlying fine-grained native alluvial sediments.
- The estimated groundwater seepage velocity is approximately 0.05 feet per day (18 feet per year) to the north-northwest.
- Arsenic, chromium, and copper concentrations have been detected in groundwater from one or more on-site groundwater monitoring wells.

- Concentrations of copper, chromium, and arsenic in groundwater appear to be declining. Concentrations of these metals were below maximum contaminant levels (MCLs) in the most recently collected groundwater samples.

- Groundwater in the saturated dredge spoil sediments that was impacted by the CCA release does not appear to have migrated off site.

Recommendations

- Install a monitoring well east of MW-3 and the fire hydrant (previously referenced as MW-6 in EMCON's August 31, 1993, scope of work) at the site perimeter, downgradient of the cleanup area to confirm that impacted groundwater is not reaching the Willamette River at levels that could result in environmental impacts.

- Continue to monitor groundwater quarterly to evaluate the effectiveness of remediation. Analyze groundwater samples for dissolved copper, chromium, and arsenic. Collect quarterly depth-to-groundwater measurements.

- Evaluate groundwater flow direction on a quarterly basis.

- Following at least 3 quarters of monitoring, reevaluate the dissolved metal concentrations and groundwater flow direction, and evaluate if further actions are necessary.

1 INTRODUCTION

1.1 Purpose

This report describes the investigation and remediation activities for the chromated copper arsenic (CCA) soil and debris cleanup (conducted during November and December 1992 and April and May 1993) at the Facility situated at 5700 NW Front Avenue, Portland, Oregon. To evaluate the effectiveness of the cleanup and the potential for groundwater impacts, EMCON also supervised the installation of six groundwater monitoring wells. The objectives of this project were to

- Remediate concentrations of copper, chromium, and arsenic that exceed regulatory criteria.
- Document the remediation process and procedures.
- Confirm the removal of soils containing total chromium, copper, and arsenic at or above the Oregon Department of Environmental Quality (DEQ) industrial soil cleanup standards (OAR 340-122-045) or U.S. Environmental Protection Agency (USEPA) hazardous waste criteria (40 CFR §261.24).
- Sample and assess groundwater quality and flow direction at the Facility. Groundwater monitoring is ongoing.

1.2 Facility Description

The Facility is situated in Township 1 North, Range 1 East, Willamette Meridian (see Figure 1-1). The facility address is 5700 NW Front Avenue, Portland, Oregon. GWCC formulates and distributes industrial chemical products for commercial use. The facility consists of a main building divided into formulation, warehouse, laboratory, and office areas; a parking lot; a storage yard; and several aboveground storage tanks (see Figure 1-2). The site is relatively flat, sloping gently less than 3 percent, toward the Willamette River. The site is surrounded by industrial properties and is zoned for industrial use.

1.3 Background

From 1984 until 1986 GWCC-Chemax formulated and distributed a product containing 50 percent CCA (Chromated Copper Arsenic) under the subregistration name of "Woodlast." The chemical constituents and corresponding average concentrations in this CCA formulation were as follows:

CCA Constituents	Average Concentration
Copper Oxide (CuO)	9.3%
Chromic Acid ($H_2Cr_2O_7$)	25.0%
O-Arsenic Acid (HAs_2O_3)	20.0%
Water (H_2O)	45.8%

This information was obtained from GWCC Material Safety Data Sheets (MSDS) attached as Appendix A. GWCC also formulated and distributed a similar CCA blend for Rentokil Corporation from 1986 to 1988. GWCC estimates that CCA was formulated, handled, and managed at the Facility for approximately 1,305 days (i.e., September 1, 1984 to March 31, 1988).

The CCA solution was formulated in three 5,000-gallon aboveground tanks located in the warehouse. The former CCA formulation area (see Figure 1-2) measured approximately 38 feet long by 16 feet wide. The area was contained on all sides; three sides were contained by a 6-inch high by 4-inch wide concrete curb; and the fourth side was contained by the northeast building wall and a containment trench. Two sections of this curb were removed after GWCC discontinued CCA formulation activities. The concrete containment trench (approximately 50-feet long, 1-foot wide, and 6-inches deep) was used to collect wash-down waters, spills, or product overflow from the CCA formulation area.

During construction of two, 2-feet wide by 2-feet long by 3-feet deep, concrete sumps in the former formulating area in 1992, GWCC maintenance and production workers discovered discolored concrete, gravel, and subsurface soils in the area below the concrete floor on the northeast side. This discovery was made on September 14, 1992, and reported to facility management on that same date. GWCC contracted with EMCON to supervise site assessment activities and to characterize the nature and extent of potential soil impacts. From December 1992 through April 1993, extensive studies were undertaken to assess the subject area. This work has been carried out in three phases. Phase 1 work involved the characterization and removal of impacted soils that contained CCA constituents above target levels. Phase 1 confirmatory sampling and analysis revealed that CCA constituents were present in specific locations at concentrations that exceeded DEQ industrial soil cleanup (SoClean) standards (OAR 340-122-045). These locations included:

- The top 6 inches of soil exposed in the base of the Phase 1 excavation (i.e., at 24 to 30 inches below the original concrete surface), and

- Soils to depths ranging from 4 feet to 12 feet below existing grade along the northeast wall (Row 1), and below the former containment trench.

Phase 2 work involved characterizing and documenting the remaining extent of the CCA impacted soils in the former CCA formulation area. Phase 3 work included the removal and disposal of the soils from the areas identified in Phase 2 and a preliminary evaluation of groundwater quality in the subject area. Groundwater was evaluated by installing two temporary monitoring wells inside the main warehouse. EMCON also supervised the installation of four permanent groundwater monitoring wells in September 1993. Quarterly groundwater monitoring is ongoing.

1.4 Work Completed

On behalf of GWCC, EMCON performed the following activities as part of the assessment and remediation work:

- Visited the site and met with GWCC representatives to evaluate GWCC's assessment and remedial actions to be taken

- Prepared sampling and analysis plans (SAPs), health and safety plans (HSPs), and remediation workplans

- Collected soil samples from the former CCA formulation area consistent with the SAPs and HSPs

- Coordinated with GWCC's remediation and waste disposal subcontractors (Olympus Environmental, Inc. [OEI], Kramer & Gehlen [K&G], Riedel Environmental Services, Inc. [Riedel], Chemical Waste Management, Inc. [CWM], Waste Management of Oregon [WMO], and Geotechnical Services, Inc. [Geo Tech]), during implementation of remedial activities

- Coordinated design and construction of some of the external and subsurface shoring to support building and foundation structures during excavation activities

- Coordinated the excavation activities and the installation of two temporary groundwater monitoring wells (TMWs)

- Coordinated drop box delivery, transportation, stabilization, and landfill disposal with WMO and CWM

- Collected confirmatory soil samples from the excavation and from excavated soils consistent with Test Methods for Evaluating Solid Waste - Physical Chemical Methods, USEPA SW-846 (November 1986)

- Sampled groundwater from beneath the excavation and waste liquids from equipment decontamination and well development (Note: the samples were submitted to Columbia Analytical Services, Inc. [CAS], for CCA constituent testing by USEPA Methods 6010 [total metals] and 1310/6010, metals by the toxicity characteristic leaching procedure [TCLP])

- Evaluated laboratory test results from soil, groundwater, and waste liquid samples

- Reviewed applicable regulatory soil cleanup and groundwater quality standards

- Coordinated drop box delivery and disposal of soil with WMO and CWM

- Surveyed the excavation area and surrounding building structures and prepared an accurate map of the site

- Measured depth to groundwater at the TMW locations

- Coordinated final excavation backfilling, concrete capping, and installation of TMW vaults with GWCC and OEI

- Supervised installation of four permanent groundwater monitoring wells (MWs), sampled these wells, and evaluated test results

- Estimated groundwater flow rate and direction

- Evaluated the potential for impacts to human health and the environment

GWCC was responsible for preparing proper safety zones, draping 6-mil plastic sheeting from the building ceilings to the floor to contain generated dust, and constructing a flying buttress for wall support during the remediation activities.

WMO and CWM were responsible for delivering and retrieving the drop boxes, generating Uniform Hazardous Waste Manifests (manifests), providing liability insurance when transporting waste materials, disposing of the waste in appropriate licensed disposal facilities, and sending signed manifests back to GWCC within 45 days of waste receipt.

OEI was responsible for providing all excavation equipment, removing, segregating, and containerizing the soil and debris in appropriate drop boxes, coordinating backfill

material deliveries, complying with appropriate OSHA regulations in accordance with the HSP, and providing a summary of field activities to EMCON.

Riedel was retained to vacuum the area surrounding the excavation and the transportation aisle between the excavation area and the door on the northwest side of the Chemax warehouse. This activity was supervised by GWCC personnel. The dust collected from vacuuming was added to a drop box, designated to contain hazardous waste, and was transported to the CWM TSD facility in Arlington, Oregon.

Geo-Tech was responsible for installing the groundwater monitoring wells.

In addition to overall project management, specific EMCON responsibilities included:

- Monitoring project health and safety procedures, excavating, and backfilling activities
- Reviewing manifests
- Coordinating floor vacuuming and groundwater monitoring well installation
- Collecting waste liquid, soil and debris samples, and confirmatory soil and groundwater samples; preparing chain-of-custody documentation and sending samples to CAS; evaluating laboratory test results; documenting excavation and sampling activities
- Providing recommendations for future actions based on project results

CAS, a Kelso, Washington-based analytical laboratory, was responsible for analyzing soil, debris, groundwater, and wastewater samples. Samples were shipped to CAS accompanied by EMCON chain-of-custody documentation.

2 PRELIMINARY SOIL ASSESSMENT

2.1 Sampling and Analysis

EMCON visited the Facility on September 23, 1992, to observe the discolored concrete gravel, and subsurface soils in the former CCA formulation area. During the visit, EMCON collected three samples (i.e., concrete chip, wall scraping, and surface soil; Chemax - 001 through Chemax - 003) from the subject area. The samples were collected in clean sampling spoons by an EMCON environmental chemist wearing new latex rubber gloves. Sampling equipment was washed with detergent and rinsed with distilled water between samples. The samples were placed in appropriately labeled new glass bottles and transported in an iced cooler accompanied by chain-of-custody documentation to CAS. The samples were analyzed for total cyanide and TCLP regulated metals using USEPA Methods 9010 and 3010/6010, respectively. The laboratory test results (see Table 2-1 and Appendix B) indicated the presence of arsenic and chromium at concentrations above TC regulatory levels (Ref.: Federal Register Vol. 55, No. 61, Page 11804). The test results are summarized in Table 2-1.

EMCON and GWCC representatives met on October 9, 1992, to discuss reporting responsibilities, the test results from the initial sampling, and to develop a strategy for future work at the site. Prior to this meeting EMCON had contacted the Oregon Department of Environmental Quality (DEQ) to request general advice regarding general reporting responsibilities for hazardous material releases that occur as a result of inadvertent spills. The Department informed EMCON that DEQ does not require facilities to report contained hazardous substance releases that have occurred from past minor inadvertent spills if those spills did not constitute a sudden accidental release (i.e., within a 24-hour period) greater than the reportable quantity (RQ) value (Ref.: 40 CFR Part 302, Table 302.4).

The GWCC representatives agreed that additional site sampling should be performed to attempt to determine the boundaries of the hazardous substance release. GWCC decided that shallow and intermediate samples should be collected in areas approximately 10 to 15 feet from the stained soil area originally excavated to install the concrete sumps. Accordingly, under GWCC's direction, EMCON visited the site on October 12, 1992, and collected a total of eight intermediate depth and additional shallow surface soil samples from five discrete locations (S1 through S5) surrounding the area originally found to contain stained soils.

The samples were collected and managed in the same manner as those collected at the Facility on September 23, 1992. They were analyzed by CAS for total and TCLP chromium and arsenic, and total copper and lead using appropriate USEPA methods. The test results (see Table 2-2 and Appendix C) indicated the presence of chromium above the TC regulatory level (5 ppm) for six of the eight samples collected. No other constituents tested exceeded the regulatory criteria.

EMCON with GWCC representatives met on October 27, 1992, to discuss the results from the second round of soil sampling, and to plan future actions at the site. GWCC decided to collect a third set of intermediate-depth soil samples (24 inches below ground surface [bgs]) from the perimeter of the former CCA formulations area.

On October 29, 1992, EMCON collected six samples around the perimeter of the former CCA formulation area. The samples were collected using a clean stainless steel hand-auger and managed in the same manner as those collected at the site on September 23, and October 12, 1992. Each sample was analyzed by CAS for total and TCLP chromium and arsenic, and total copper and lead using appropriate USEPA test methods. Additionally, CAS determined trivalent and hexavalent chromium concentrations using USEPA Method 3795/6010. The test results (see Table 2-3 and Appendix D) showed that chromium and arsenic concentrations were below their respective TC regulatory levels for all samples tested. However, analyses of total metals indicated the presence of arsenic at concentrations above the DEQ's soil action cleanup level for industrial sites (Ref.: Oregon Administrative Rules [OAR] 340-122-045.)

Information obtained from the preliminary soil investigation was used to prepare the Phase I workplan (Ref.: Phase I *Chemax Soil and Debris Cleanup Plan*).

2.2 Regulatory Classification

EMCON reviewed Title 40 of the Code of Federal Regulations (CFR) Parts 261 and 268 relating to the identification and listing of hazardous waste and land disposal restrictions (LDR), respectively, as well as the DEQ Hazardous Waste Management Regulations, Oregon Administrative Rules (OAR) Chapter 340, Divisions 100 through 110, and 120) to ascertain the appropriate regulatory classification of the soil and debris.

Concrete, soil, and gravel are not ignitable, corrosive, or reactive. Furthermore, GWCC's MSDS records indicate that CCA is neither ignitable, corrosive, or reactive, nor is CCA listed by USEPA as a process hazardous waste process in 40 CFR Part 261.31 to 261.33. However, laboratory test results summarized in Tables 2-1 and 2-2 indicate that 9 of 11 samples collected at the site exceeded the arsenic and/or chromium TC regulatory level for a characteristic hazardous waste (waste codes D004 and D007, respectively). Therefore, the stained soil and concrete from the original sump excavation area were classified as a characteristic hazardous waste under the toxicity criterion.

2.3 Waste Stream Documentation

Using information obtained from laboratory test results and USEPA regulations, GWCC prepared three waste profiles and land disposal restriction forms (see Appendix E) representing the waste streams listed in Table 2-4.

Samples required for waste acceptance by the receiving disposal facilities were collected by EMCON on December 14 and 16, 1992. Additional required documentation such as manifests and proof of insurance was provided by CWM and WMO.

3 PRELIMINARY SOIL REMOVAL AND SAMPLING

3.1 Soil and Debris Excavation and Disposal

With technical assistance from EMCON, GWCC's subcontractor OEI excavated and containerized approximately 100 cubic yards (or about 144 tons) of concrete, soil, and debris from the former CCA formulating area between December 7 and 11, 1992.

Using appropriate heavy mobile equipment (i.e., concrete cutters, backhoe, and front end loader) OEI fractured a 19 by 44 foot section of concrete floor in the former CCA formulating area and began segregating soil and concrete from Areas 1 and 2 (see Figure 3-1).

OEI also removed approximately 0.25 inch of CCA-stained concrete from the surface of the northeast wall adjacent to Area 1 using a scabbler. The scrapings, soil, and debris removed from Area 1 were containerized by OEI into CWM drop boxes.

At GWCC's request, OEI also removed concrete and soil (to a depth of about 30 inches) from Area 1 and a triangular section of concrete and about 30 inches of soil below it from the northeast corner of the excavation area and placed these materials into CWM drop boxes.

WMO delivered eight drop boxes (i.e., two 16.5 cubic yard boxes and six 20 cubic yard boxes) between December 9 and 11. OEI used these boxes to contain concrete and soil (removed to a depth of about 30 inches) from Area 2. Preliminary shallow (18 inches) soil samples collected by EMCON and analyzed by CAS, in October and November 1992, indicated that Area 2 soils did not contain arsenic or chromium above the TC criteria (5.0 parts per million [ppm]) when tested using the TCLP (see Figure 3-2). To confirm this, EMCON collected discrete grab samples from 4 of the 10 OWM drop boxes. The laboratory test results (see Appendix F) indicated that the average TCLP arsenic and chromium concentrations were 0.1 and 2.5 ppm, respectively, and are below hazardous waste characteristic levels as defined by DEQ and USEPA.

On December 11, 1992, OEI decontaminated all of their mobile equipment and containerized the decontamination (decon) wash water in a plastic 55 gallon drum. Decontamination involved washing the equipment with detergent and hot tap water from the Facility potable water supply. These activities were performed over 6-mil plastic

sheets. The liquids were drained into the 55-drum and labeled as hazardous waste. Sampling procedures and analytical results are described in Section 3.3 of this report.

On December 14 through 17, 1992, WMO and CWM transported the soil and debris to the Columbia Ridge Landfill Arlington, Oregon, and to the Arlington hazardous waste treatment, storage, and disposal (TSD) facility, respectively.

WMO service tickets (see Appendix G) indicated that approximately 61 tons of Area 2 (nonhazardous) soil and debris was transported and landfilled. CWM hazardous waste manifests (see Appendix H) indicated that approximately 56 tons of Area 1 soil and debris were transported to the Arlington hazardous waste landfill.

3.2 Soil and Liquid Sampling and Analysis

Using the December 2, 1992, *Phase I Chemax Soil and Debris Cleanup Plan* as a guide, EMCON mapped the excavation area and marked thirty-six 5 by 5-feet cells (grids). Four discrete soil samples were collected from the surface of the excavation (30-inches bgs) within 12 randomly-selected discrete points. The four discrete samples from each cell were composited to form 12 separate samples, representative of each cell. The samples were placed in labeled glass bottles and capped. The bottles were packed in an ice chest and transported with chain-of-custody documentation to CAS. This confirmation sampling was designed to identify those remaining soils with chromium, copper and arsenic concentrations above DEQ industrial site soil cleanup standards.

Test results from samples collected in December 1992 (see Tables 3-1 and 3-2, and Appendix I) indicated that soil samples from along the northeast wall contained up to 2,380 ppm total chromium, 1,260 ppm total copper, and 5,300 ppm total arsenic. TCLP results from the same samples also indicated that some of the soils remaining along this wall were characteristic hazardous wastes.

Using new glass colliwassa tubes, EMCON also collected one composite liquid sample from concentrated CCA product (pumped by GWCC from a former storage tank) and decon rinse water. The TCLP test results (see Appendix J) indicated that this liquid contained chromium above the 5 ppm TC standard. Accordingly, EMCON prepared a separate CWM profile for this waste stream (see Appendix E). However, GWCC determined that liquid treatment costs at the Tektronix (TEK) wastewater treatment facility (permitted RCRA treatment facility) were much less than costs quoted from CWM. Accordingly, a composite liquid sample was sent to TEK for waste analysis and profiling. The TCLP test results from this sample confirmed that only chromium exceeded the TC rule standard.

EMCON and GWCC representatives met to discuss progress of the CCA cleanup activities and decided to conduct additional site sampling and analysis. In an attempt to further define the areas of soil having CCA concentrations above the DEQ industrial soil

cleanup levels, EMCON collected seven additional soil samples from along the northeast wall of the excavation area on December 23, 1992: intermediate depth (34 inches) and lower depth (54 inches) samples from cells 1 and 9; lower depth samples from cells 4 and 6, and one deep (78 inches) soil sample from cell 7. Samples were collected using procedures described in Section 2.1 of this report. CAS transported the samples with chain-of-custody documentation to their Kelso, Washington, laboratory and analyzed them for total CCA constituents.

Test results from the December 23, 1992, sampling event (see Table 3-3 and Appendix K) indicated that soil at the 54-inch depth contained up to 532 ppm total chromium, 958 ppm total copper, and 8 ppm total arsenic. However, the concentrations for the constituents in cell 7 were significantly higher.

In response to the concentrations of CCA constituents found at the 78-inch depth in cell 7, EMCON returned to the site and collected a discrete soil sample 108 inches below surface from the northeast side of cell 7 to further evaluate the extent of soil impacts. Additionally, EMCON collected four excavation sidewall samples (randomly selected from excavation perimeter cells 5, 10, 27, and 34) approximately 18 inches below the surface of the concrete to assess whether CCA constituents had been adequately removed from the edges of the excavation area. The samples were transported by CAS courier with chain-of-custody documentation to their Kelso, Washington, laboratory and analyzed for total CCA constituents.

Test results (see Table 3-4 and Appendix L) indicated that elevated concentrations of arsenic and chromium (i.e., 7,370 and 2,140 ppm, respectively) were present nine feet below the original surface level in cell 7. In addition, the test results indicated that arsenic was present in soils on each of the sidewalls of the excavation area at concentrations that exceeded DEQ's industrial soil cleanup (SoClean) standards. These data indicated that additional soil removal below the northeast wall and additional soil removal from each side of the excavation area would likely satisfy DEQ cleanup standards.

In an effort to assess the vertical extent of the soil impact exceeding DEQ SoClean standards, EMCON collected additional composite samples from cells 24 and 26 at a level approximately 4 inches below (i.e., 34 inches) the current excavation depth. Four discrete, equal volume soil samples from within each cell were composited into a single sample representative of each cell. The two composite samples were transported with chain-of-custody documentation to CAS and analyzed for total CCA constituents. Test results (see Appendix M and Table 3-5) indicated that DEQ SoClean standards could be achieved by excavating an additional 4 inches of soil from cells 24 and 26.

Information obtained in Phase I was used to prepare the Phase II workplan (Ref.: *Chemax Phase II Soil and Debris Cleanup Plan*).

Phase II work (described in the Phase III workplan, Ref.: *Chemax Phase III Soil Removal and Sampling and Analysis Plan*) involved the characterizing and documenting the remaining extent of the CCA impacted soils in the former CCA formulation area. Phase III work included the removal and disposal of the soils from the areas identified in Phase II and the evaluation of groundwater quality at the site. These activities are described in the following section.

4 FINAL SOIL REMOVAL AND SAMPLING

4.1 Soil and Debris Excavation and Disposal

Following initial soil and debris removal, areas with metals concentrations in excess of target levels had been identified. Plans for additional excavation activities were described in the Phase III workplan (see Figure 4-1). This section documents activities carried out under the *Chemax Phase III Soil Removal and Sampling and Analysis Plan.*

To prevent building damage during excavation activities, GWCC, with assistance from their structural engineering contractor (Kramer & Gehlen), constructed a flying buttress using 4-inch-diameter steel pipe and 2-inch by 4-inch iron beams. The buttress, which extended from the concrete pad outside the warehouse to approximately 5 feet from the warehouse roof, supported the warehouse wall and foundation adjacent to the CCA excavation area. OEI excavated 3-feet-wide by 6-feet-long sections that varied in depth from 6 feet to 14.5 feet bgs. After OEI had excavated a trench perpendicular to the wall, EMCON collected confirmatory soil samples (refer to Section 4.2). OEI immediately backfilled the trench with a sand, gravel, and concrete mixture. This technique was repeated until each of the target cells had been excavated. Excavation activities were conducted without apparent damage to the building or foundation.

Monitoring well MW-1, formally referenced as Chem-2 in the Chemax Phase II workplan, and the interior building excavation locations were referenced to the building. The base of the fire hydrant to the north of monitoring well MW-1 was selected as benchmark 1. EMCON established the base of the fire hydrant as a site elevation reference (100.00 feet). All other site elevations are referenced relative to this point. EMCON determined the relative elevations of monitoring well MW-1 (the top of casing of the well), and established two temporary benchmarks inside the GWCC warehouse. A Zeis Ni-40 automatic level (to $\pm$0.004 feet) was used to survey the site.

Under EMCON's supervision, OEI excavated and containerized approximately 78 tons of soil characterized as nonhazardous, 1.22 tons of hazardous miscellaneous debris (e.g., plastic sheeting, used personal protective equipment [PPE]), and 83 tons of CCA soil and concrete (classified as characteristic hazardous waste) from the former CCA formulating area between April 14 and April 30, 1993. OEI filled CWM hazardous waste drop boxes with soils that were visually stained with CCA constituents (i.e., blue-green color), and filled WMO nonhazardous drop boxes with soil that did not appear to

be stained. Soil segregation was confirmed by subsequent sampling (Refer to Section 4.2). This work was conducted only by authorized personnel who had completed 40-hour Occupational Safety and Health Administration (OSHA) hazardous materials training and had read and signed the HSP (see Section 4 in EMCON's December 2, 1992, Phase II Soil and Debris Cleanup Plan).

On April 7, 1993, EMCON measured the outside building dimensions of the northern warehouse section to confirm building dimensions on the Westhawk Engineering "CHEMAX Plant Layout" plan dated February 16, 1983. The scaled plan dimensions corresponded to measured building distances; however, a few site building changes had occurred since the Westhawk plans were completed.

April 22 to May 3, 1993. OEI excavated Row 1 soils (along the northeast wall) to depths ranging from 9 to 14 feet bgs. Row 2 cells were excavated to depths ranging from 6 feet to 9 feet bgs, and approximately 2 feet of soil was removed from remaining target areas. Excavation depths at specific cell locations were selected based on soil sampling and analysis, guidance provided in the Phase III SAP and by visual observations made by EMCON during excavation. The extent of the excavation was limited due to building structural safety considerations. OEI backfilled the excavation area in sections with a mixture of sand, gravel, and concrete to maintain the structural integrity of the building foundation.

EMCON collected 14 discrete confirmatory soil samples from 9 cells in Row 1. The samples were collected from cell side walls using hand augers, and from cell bases using a backhoe shovel. In addition, three composite samples were collected from cells in Rows 2 and 3. The laboratory test results are presented in Tables 4-1 and are discussed in detail in Section 4.2 of this report.

OEI removed plastic sheeting and wooden frames from the perimeter of the excavation area and placed them into five 55-gallon open-top steel drums. Used personal protective equipment (PPE) (e.g., respirator cartridges, Tyvek suits, and rubber gloves) was also placed into these drums.

WMO delivered a total of eight 20-cubic-yards drop boxes between April 14 and May 3. OEI used these boxes to contain concrete and soil from cells 19 through 36. EMCON collected samples from five of these boxes (Nos. 1, 7, 8, 9, and 10) in April and May, 1993. These materials were analyzed by CAS. The laboratory results indicated that these materials did not contain arsenic or chromium above the 40 CFR §261.24 TC regulatory level (5.0 parts per million [ppm]) when tested using the TCLP (see Table 4-1 and Appendix N).

CWM delivered six 20-cubic-yard drop boxes to the facility between April 14 and May 3, 1993. OEI used five of these drop boxes to contain visibly stained soil, concrete

and asphalt. The visibly stained soil was removed to a maximum depth of about 14.5 feet bgs from cells 1 through 18.

OEI decontaminated all of their mobile equipment and containerized the wash water in a plastic-lined, steel 55-gallon drum. Decontamination involved washing the equipment with detergent and hot tap water. These activities were performed over 6-mil plastic sheets. The liquids were drained into the 55-drum and labeled as hazardous waste. Waste liquid sampling procedures and analytical results are described in Section 4.2 of this report.

On May 7, 1993, OEI completed the backfilling activities and swept the soil and debris from the excavation work areas. Riedel vacuumed these areas and the vehicle aisles inside the GWCC warehouse. These materials were also placed in CWM drop boxes. CWM transported the soil designated as hazardous waste to the Arlington, Oregon, TSD for stabilization before disposal. Five drums containing miscellaneous debris (i.e., plastic sheets, wooden frames, and PPE) were sent to the CWM Arlington TSD facility for direct landfill. WMO transported the drop boxes containing nonhazardous waste to its transfer station located in Portland, Oregon. These drop boxes were transported by WMO to the Columbia Ridge lined, solid waste landfill in Arlington. WMO service tickets (see Appendix O) indicate that 78.18 tons of nonhazardous soil and debris were transported and landfilled.

CWM uniform hazardous waste manifests and land disposal restriction certifications for the five drums and the five drop boxes that contained debris and soil classified as hazardous waste are attached (see Appendix P). This documentation indicated that 83.11 tons of soil and 2,440 pounds of debris designated as hazardous waste were transported to the Arlington hazardous waste landfill for disposal.

4.2 Confirmation Sampling and Analysis

Using the April 8, 1993, *Chemax Phase III Soil Removal and Sampling and Analysis Plan* as a guide, EMCON collected soil samples from the base and sidewalls of most of the cells in the excavation area from April 22 to April 30, 1993. The samples in cells 1 through 18 were collected using a backhoe shovel, which was decontaminated between samples. Other samples were collected using clean stainless steel hand shovels.

The samples were placed on ice in an insulated chest and transported with chain-of-custody documentation to CAS. This confirmation sampling was designed to identify those remaining soils with chromium, copper, or arsenic concentrations above DEQ SoClean soil cleanup standards for industrial sites.

Laboratory test results (see Table 4-2 and Appendix Q) indicated that discrete soil samples collected along the northeast wall contained up to 1,320 ppm total chromium and 2,020 ppm total copper. Arsenic was detected at up to 119 ppm. These concentrations

are below site target cleanup levels and regulatory standards. The arithmetic average of total concentrations of chromium, copper, and arsenic from bottom samples collected in the excavation are approximately 140, 176, and 22 ppm, respectively. These concentrations are below site target cleanup levels and regulatory standards (see Table 4-2).

No further excavation was undertaken because site target cleanup levels had been met and regulatory standards were not exceeded.

4.3 Monitoring Well Installation, Sampling and Analysis

As specified in Section 2.4 of the EMCON *Phase III Soil Removal and Sampling and Analysis Plan,* Geo-Tech installed two well points and TMW casings inside the vertically mounted PVC pipes at cells 2 and 7 on May 6, 1993. These wells were hand driven using a weight mounted on a tripod. The temporary wells were constructed by initially placing 6-inch-diameter PVC pipes (casings) in the excavation to depths of 8 feet for TMW-1 and 11.5 feet for TMW-2. These casings were set by Olympus Environmental, Inc., of Portland, Oregon. The excavation was then backfilled around the casings to an elevation just below the adjacent concrete slab. For each well, a 24-inch-long stainless steel drive point with 0.01-inch diameter, continuous slotted screen, was attached to 2-inch-diameter black steel pipe. These assemblies were lowered to the bottom of the 6-inch casings and driven to approximately 18.5 feet (TMW-1) and 19.5 feet (TMW-2 below the existing slab. The wells were completed with flush-mounted steel vaults. Well logs were prepared by Geo-Tech.

On May 10, 1993, EMCON measured and recorded groundwater levels from both TMWs, purged approximately 15 gallons from each TMW, then collected groundwater samples. EMCON transferred the purged groundwater into a properly labeled 55-gallon drum. The groundwater samples were sent to CAS and analyzed for total and TCLP copper, chromium, and arsenic. EMCON also collected groundwater samples from these wells on May 10, 11, 17, and 20, 1993. The analytical results are presented in Appendix R and summarized in Table 4-3. They indicate that total dissolved chromium and copper concentrations exceeded drinking water MCLs (0.1 ppm and 1.3 ppm, respectively) (Ref.: Drinking Water Regulations and Health Advisories, USEPA Office of Water, December 1993).

On May 11, 1993, EMCON surveyed the relative vertical elevations of the temporary monitoring wells installed in the interior building excavation. EMCON gauged the depth to water in MW-1, and TMW-1 and TMW-2 using an electronic water level probe. Relative groundwater elevations were calculated at each well by subtracting the depth to water below the top of the well casings from the previously established benchmark elevations (see Table 4-4). Straight line interpolation between each point indicates a 0.2 foot groundwater elevation contour interval was used to plot estimated groundwater elevation contours. The groundwater gradient was estimated to be 0.018 vertical feet per

horizontal foot. Based on measurements for the temporary wells, groundwater flow was generally to the northwest. Groundwater level measurements from TMW-1, TMW-2, and from the existing monitoring well (MW-1) indicated that the groundwater flow direction is to the northwest.

4.4 Waste Liquids Sampling, Analysis, and Disposal

As previously mentioned in Section 3.2 of this report, EMCON submitted a composite sample of the decon liquid/groundwater to TEK for analytical evaluation and hazardous waste profiling. The TEK waste profile documentation (see Appendix J) indicated that this liquid was properly classified as a characteristic hazardous waste for chromium (USEPA waste code D007). On August 12, 1993, Gresham Transfer transported the two 55-gallon drums to Tek for proper treatment in TEK's RCRA wastewater treatment system (refer to Uniform Hazardous Waste Manifest and land disposal restriction form, Appendix S).

At the conclusion of Phase III, EMCON recommended that GWCC further assess groundwater quality at the Facility. Specifically, EMCON recommended that GWCC install four additional groundwater monitoring wells (MW-2 through MW-4) and monitor them for CCA metals. Groundwater assessment work conducted to date is described in detail in the following section.

5 GROUNDWATER ASSESSMENT

5.1 Monitoring Well Network

5.1.1 Selection of Location for Permanent Groundwater Wells

Based on EMCON's earlier estimate of the groundwater quality and flow direction, GWCC contracted with Geo-Tech to install four permanent groundwater monitoring wells at the Facility: one crossgradient of the CCA excavation (MW-2) one directly downgradient of the CCA excavation (MW-3), and two near the edge of the northeast property line toward the Willamette River (MW-4 and MW-5, see Figure 5-1). MW-1 (formerly labeled as Chem-2) was installed in 1990 as part of a previous groundwater sampling program associated with the storage of copper sulfate (Ref.: July 18, 1990, Letter Report from EMCON to GWCC Re: Test Boring Program at Chemax Site).

5.1.2 Monitoring Well Construction

Four monitoring wells, MW-2 through MW-5, were installed at the Facility from September 30 to October 5, 1993. Geo-Tech advanced boreholes using a CME 55 drilling rig equipped with 6.5-inch inside diameter hollow stem augers. A monitoring well was constructed inside each borehole with 2-inch-diameter schedule 40 PVC pipe. The well screens were constructed of 0.01-inch continuous slot PVC and were prepacked with 20-40 sieve Colorado silica sand. The use of prepacked well screens instead of standard screens typically reduces the amount of sediment passing through the well screen during purging and sampling, and reduces the amount of sediment and turbidity in the groundwater samples.

As part of construction and installation, the annular spaces between the well screens and formation were packed with 10 to 20 sieve Colorado silica sand. A surge block was used to pack the sand between the screen well casing and the native soil formation. The sand packs were brought to approximately 2 feet above the top of the screen. A layer of coarse grade bentonite chips was placed in the annular space above the sand pack in each well and hydrated with potable water. The four monitoring wells were completed with locking caps and flush-mounted traffic approved steel vaults.

Stainless steel split spoon samples were used to collect soil samples for lithologic identification. The samplers were driven using a 140-pound hammer dropped approximately 36 inches. The number of blows required to advance the sampler 18 inches, at 6-inch intervals, were recorded on the boring logs (see results for Standard Penetration Test, Appendix T). Lithologic descriptions were recorded. Drilling, soil sampling, and monitoring were also conducted by a geologist working under the direct supervision of an Oregon registered professional geologist.

5.1.3 Lithology

Well logs containing geologic descriptions and well construction information were prepared for each well (see Appendix T and Table 5-1). The geologic descriptions were prepared by a geologist based on the drill cuttings and split spoon soil samples.

The wells were all constructed through asphalt with a base layer of sandy gravel fill. The soil encountered in the upper 15 feet of the borings was generally uniform in texture and consisted primarily of brown fine to coarse sand. Below a depth of 15 feet, the sand included layers of sandy silt, clayey silt, and silty clay of varying thicknesses. In MW-5, the deepest well at the facility, the bottom 15 feet of the 35 feet deep well consisted primarily of clayey silt.

5.1.4 Well Development

The newly installed monitoring wells were developed on October 5, 1993, using a 2-inch-diameter submersible pump. Development was expected to reduce the amount of sediment that would pass though the sand pack and into the well during sampling. The well volume for each well was calculated before well development and the well was then surged with a decontaminated teflon bailer for a minimum of 10 minutes by rapidly raising and lowering the bailer throughout the screened interval. A pump was then lowered down to the bottom of the well and a minimum of 11 casing volumes (approximately 35 gallons) were removed from each well. Each well except MW-5 produced relatively clear water.

Monitoring well MW-5 yielded less than the other wells and produced slightly turbid water after purging 11 casing volumes from the well. The turbidity is apparently due to the clayey silt in the formation in the bottom 15 feet of the well (see Appendix T). Development terminated when there was no significant improvement in the water clarity between purgings.

Downhole equipment used for well development was decontaminated before use in each well. The decontamination procedures were as follows, in sequence: distilled water and nonphosphated soap wash, distilled water rinse, dilute nitric acid rinse, distilled water rinse, dilute methanol rinse, and a distilled water rinse. The decontamination rinse

water, purge water, and drill cuttings were contained in separate, labeled 55-gallon drums (see Section 5.3.3).

5.2 Groundwater Level Measurements

5.2.1 River Gauge Installation

Shallow groundwater at the site generally discharges to the Willamette River. A gauging location on the river was established to measure the river surface elevation for comparison with the groundwater level measurements. The gauging station was constructed at a pier northeast of the site (see Figure 5-1 and Appendix U). The pier owner, McCall Oil and Chemical Corporation, provided approval for access and pier use. The station was constructed by fastening a 1¼-inch-diameter polyvinyl chloride (PVC) pipe to a piling, with the bottom of the pipe submerged in the river. The location and elevation of the measuring point (top of the pipe) were surveyed relative to the site benchmark.

5.2.2 Estimated Groundwater Flow Direction and Rate

A local benchmark with an arbitrary 100 feet datum was established at the fire hydrant behind the Facility (see Figure 5-1). The monitoring well surveys and water levels in the wells and river stage measurements are reported relative to this benchmark. The water levels were measured in each well using an electric wire line sounder. Depth to water measurements were recorded to 0.01 foot.

The water levels measured in the wells on October 28, 1993, ranged from 82.62 feet to 77.94 feet relative to the benchmark (see Table 5-2). The water table gradient was 0.007 foot per foot (unitless) as measured in the northern section of the site from MW-2 and MW-3. The gradient steepens to approximately 0.02 toward the river in the vicinity of MW-4 and MW-5. The elevation of the Willamette River on October 28, 1993, was 68.11 feet relative to the 100.0 foot benchmark. Based on these water levels, the groundwater flow direction was generally north. The water levels measured in the wells on January 27, 1994, ranged from 82.78 foot to 78.53 feet, relative to the benchmark (see Table 5-3). This represents an average increase in groundwater elevation at the site of approximately 0.24 foot since October 28, 1993. Groundwater data collected in January 1994 indicate that flow direction is approximately 46 degrees northwest (see Figure 5-2).

Water level measurements were initially collected from MW-1 and TMW-1 and TMW-2 on May 11, 1993. The groundwater flow direction was estimated to be approximately 30 degrees west of north. This approximation was made based on three relatively closely spaced wells and is not as representative of the groundwater flow direction estimated using data from the more widely spaced monitoring well network.

The rate of groundwater flow at the site can be estimated using the following equation (USEPA, 1990) and assumption:

$$v = KI/7.48n$$

where, v = average velocity in feet/day
n = effective groundwater seepage porosity
I = hydraulic gradient in feet/feet
K = hydraulic conductivity in gallons per day/feet^2 (gpd/ft^2)

A typical effective porosity for a fine to medium sand can be estimated at 0.2, and typical hydraulic conductivity can be estimated at 10 gpd/ft^2 (USEPA, 1990). The hydraulic gradient or slope of the water table for October 28, 1993, was 0.007 ft/ft. The estimated flow velocity calculation is as follows:

$$v = KI//7.48n$$
$$v = (10 \text{ gpd/ft}^2 \times 0.007 \text{ ft/ft}) \div 7.48 \times 0.2$$
$$v = (0.07) \div 1.496$$
$$v = 0.05 \text{ ft/day}$$
$$v = 18 \text{ ft/year}$$

Based on the above estimations of effective porosity and hydraulic conductivity, the rate of groundwater flow at the site is estimated at 0.05 foot per day or 18 feet per year. This flow rate could be high or low by an order of magnitude, because of the uncertainty in the estimate of the hydraulic conductivity.

5.3 Groundwater Protocol and Monitoring

5.3.1 Well Purging

Water level measurements were collected prior to purging wells. The electronic sounder was used for the measurements was rinsed with distilled water between wells. Each well was then purged by the removal of at least three well casing volumes before collecting the samples. A PVC bailer was used for the purging of the wells. Between wells, the bailer was decontaminated using a distilled water and a nonphosphatic soap wash, distilled water rinse, dilute nitric acid rinse, distilled water rinse, dilute methanol rinse, and a distilled water rinse. Temperature, electrical conductivity, and pH were measured between each well volume purged to establish stability of these parameters before sampling. EMCON observed that these parameters stabilized after the first volume purged.

5.3.2 Sample Collection

Groundwater samples were collected from the wells using a peristaltic pump. The 3/8-inch Masterflex Tygon tubing used in the pump was changed between sample collections and therefore only new, uncontaminated tubing entered the well during sampling. All samples were filtered in the field with a 0.45-micron filter.

The samples were picked up at the site by CAS and analyzed for total arsenic by USEPA Method 7060 and for total chromium and copper by USEPA Method 6010.

The first round of groundwater samples from monitoring wells MW-1 through MW-5 and TMW-1 were collected on October 13, 1993. A sample from TMW-2 was not collected until October 18, 1993, because pallets in the warehouse blocked access to TMW-2. A second round of samples from the wells were collected on October 26, 1993. Resampling provided a set of analytical results to compare with results of the first round and to identify potential anomalies in the data. A third round of samples from the wells were collected on January 27, 1994.

5.3.3 Purge Water and Drill Cutting Disposal

Water purged from the wells in October 1993 and drill cuttings were contained in separate, labeled 55-gallon drums. Even though the combined groundwater likely would not be classified as a characteristic hazardous waste (refer to Section 5.4.2), GWCC decided to dispose of these liquids at an off-site TSD facility. Accordingly, on December 28, 1993, five 55-gallon drums, approximately 250 gallons, of purge water was transported via Uniform Hazardous Waste to the TEK RCRA wastewater treatment facility for treatment. On December 29, 1993, ten 55-gallon drums (approximately 5,960 pounds) of drill cuttings were transported as solid waste by WMO for disposal at the Columbia Ridge solid waste landfill in Arlington, Oregon. Waste disposal documentation is presented in Appendix V. Waste designations were based on laboratory test results from the groundwater and soil cuttings removed during well construction and monitoring (see Appendix W, pages 3 and 4). Water purged from the wells in January 1994 (approximately 28 gallons) is temporarily stored in one on-site 55-gallon drum. GWCC plans to dispose of this liquid after the drum has been filled with additional purge water from future groundwater sampling.

5.3.4 Analytical Test Methods

The groundwater samples were analyzed for total arsenic by USEPA Method 7060 and for total chromium and copper by USEPA Method 6010. Quality control procedures were reviewed for each data package. No discrepancies were identified in field sampling documentation for sample collection, filtration, or preservation. The laboratory also reviewed sample extracts for interferences that may have amplified or masked results,

but reported no indications of common interfering analytes such as aluminum, iron, sodium, calcium, or magnesium.

5.4 Regulatory Reference Levels and Analytical Results

5.4.1 Reference Levels

The MCLs established by USEPA provide guidance for groundwater containing copper, chromium, and arsenic. The reference criteria for total chromium, copper, and arsenic are 0.1 milligrams per liter (mg/L), 1.3 mg/L, and 0.05 mg/L, respectively. These regulatory standards are used in this report as reference to groundwater quality compliance.

5.4.2 Data Evaluation

The MCL for total copper in MW-1 and total chromium in MW-2 was exceeded in groundwater samples collected on October 13, 1993 (see Table 5-4 and Appendix W). Laboratory analyses of groundwater samples collected October 26, 1993 (see Appendix W), from MW-1 indicated that total copper exceeded USEPA drinking water criteria. The MCL for chromium in the sample from MW-2 was not exceeded (see Table 5-5).

Laboratory results (see Appendix X and Table 5-6) for groundwater samples collected January 27, 1994, did not exceed USEPA MCLs for copper, chromium, or arsenic.

A summary of groundwater analyses is presented in Table 5-7.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client, the client's designated representative, the client's legal counsel, and state and federal regulatory agencies, including the DEQ. Any reliance on this report by a third party, other than those named above, is at such party's sole risk. The report should be reviewed in its entirety.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

REFERENCES

EMCON. 1990. Letter Report from Kent Mathiot to Lee Zimmerli. Prepared for Great Western Chemical Company by EMCON Northwest, Inc. July 18.

EMCON. 1992. Phase I *Chemax Soil and Debris Cleanup Plan.* Prepared for Great Western Chemical Company by EMCON Northwest, Inc. December 2.

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EMCON. 1993. *Chemax Phase III Soil Removal and Sampling and Analysis Plan.* Prepared for Great Western Chemical Company by EMCON Northwest, Inc. April 8.

EMCON. 1993. Letter from Thomas Foster to James C. Brown. Prepared for Great Western Chemical Company by EMCON Northwest, Inc. June 1.

USEPA. 1993. *Drinking Water Regulations and Health Advisories.* U.S. Environmental Protection Agency. May.

Table 2-1

Great Western Chemical Company
Test Results - September 23, 1992

Sample Number	Sample Description	Hazardous Constituent	Results (ppm)[a]	USEPA Method	Regulatory Level (ppm)
CHEMAX-001	Concrete foundation chips	Arsenic	27.8	3010/6010	5.0
		Chromium	142	3010/6010	5.0
		Cyanide	ND	9010	
CHEMAX-002	Wall Scrapings	Arsenic	46.5	3010/6010	5.0
		Chromium	347	3010/6010	5.0
		Cyanide	ND	9010	
CHEMAX-003	Surface Soil (0 to 6 inches)	Arsenic	20.9	3010/6010	5.0
		Chromium	318	3010/6010	5.0
		Cyanide[b]	1.0	9010	NA

NOTE: NA = not applicable.
[a] ppm means parts per million as milligrams per liter.
[b] Result is presented as total cyanide; all other results are presented as TCLP.

Table 2-2

Great Western Chemical Company
Test Results - October 12, 1992

Sample Number	Sample Description	Sample Depth	Sample Location	Hazardous Constituent	Results		TC Regulatory Level (mg/L)
					Total (mg/kg)[a]	TCLP (mg/L)[b]	
CHEMAX-SS1	Shallow soil	0 to 6 inches	S1	Arsenic	9,900	2.6	5.0
				Chromium	5,110	47.1	5.0
				Cooper	3,500	DNT	
				Lead	36	DNT	
CHEMAX-SS2A	Shallow soil	0 to 6 inches	S2	Arsenic	226	ND	5.0
				Chromium	890	11.7	5.0
				Copper	674	DNT	
				Lead	ND	DNT	
CHEMAX-SS2B	Intermediate soil	6 to 12 inches	S2	Arsenic	10,300	11	5.0
				Chromium	1,490	11.6	5.0
				Copper	3,760	DNT	
				Lead	44	DNT	
CHEMAX-SS3A	Shallow soil	0 to 6 inches	S3	Arsenic	ND	ND	5.0
				Chromium	1,980	48.2	5.0
				Copper	427	DNT	
				Lead	ND	DNT	
CHEMAX-SS3B	Intermediate soil	6 to 12 inches	S3	Arsenic	1,240	0.2	5.0
				Chromium	1,930	26.9	5.0
				Copper	657	DNT	
				Lead	ND	DNT	

Table 2-2

Great Western Chemical Company
Test Results - October 12, 1992

Sample Number	Sample Description	Sample Depth	Sample Location	Hazardous Constituent	Results		TC Regulatory Level (mg/L)
					Total (mg/kg)[a]	TCLP (mg/L)[b]	
CHEMAX-SS4A	Shallow soil	0 to 6 inches	S4	Arsenic	ND	ND	5.0
				Chromium	12	0.02	5.0
				Copper	42	DNT	
				Lead	ND	DNT	
CHEMAX-SS4B	Intermediate soil	6 to 12 inches	S4	Arsenic	ND	ND	5.0
				Chromium	25	0.02	5.0
				Copper	35	DNT	
				Lead	34	DNT	
CHEMAX-SS5	Shallow soil	0 to 6 inches	S5	Arsenic	ND	ND	5.0
				Chromium	282	6.18	5.0
				Copper	60	DNT	
				Lead	ND	DNT	

NOTE: DND = did not test.
ND = not detected at the method reporting limit (MRL).
Totals MRLs (mg/kg): Arsenic 20; Chromium 2; Copper 2; Lead 20, TCLP MRLS (mg/L): Arsenic 0.1; chromium 0.01.

a mg/kg = milligrams per kilogram or parts per million (ppm).
b mg/L = milligrams per liter or ppm.

Table 2-3

Great Western Chemical Company
Test Results - October 29, 1992

Sample Number[a]	Sample Location	Hazardous Constituent[b]	Results		Regulatory Levels	
			Total (mg/kg)	TCLP (mg/L)	DEQ Cleanup Level (ppm)[c]	TC Regulatory Level (mg/L)
Set 3-S1	T1	Arsenic	5	ND	3	5
		Chromium (T)	90	.022	1,500	5
		Chromium (+3)	89	NA	NA	NA
		Chromium (+6)	1	NA	NA	NA
		Copper	24	DNT	80,000	NA
		Lead	ND	DNT	2,000	5
Set 3-S2	T2	Arsenic	3	ND	3	5
		Chromium (T)	22	ND	1,500	5
		Chromium (+3)	22	NA	NA	NA
		Chromium (+6)	0	NA	NA	NA
		Copper	19	DNT	80,000	NA
		Lead	ND	DNT	2,000	5
Set 3-S3	T3	Arsenic	3	ND	3	5
		Chromium (T)	131	1.23	1,500	5
		Chromium (+3)	120	NA	NA	NA
		Chromium (+6)	11	NA	NA	NA
		Copper	20	DNT	80,000	NA
		Lead	ND	DNT	2,000	5
Set 3-S4	T4	Arsenic	20	ND	3	5
		Chromium (T)	21	ND	1,500	5
		Chromium (+3)	21	NA	NA	NA
		Chromium (+6)	0	NA	NA	NA
		Copper	33	DNT	80,000	NA
		Lead	ND	DNT	2,000	5
Set 3-S5	T5	Arsenic	18	ND	3	5
		Chromium (T)	21	ND	1,500	5
		Chromium (+3)	21	NA	NA	NA
		Chromium (+6)	0	NA	NA	NA
		Copper	34	DNT	80,000	NA
		Lead	ND	DNT	2,000	5

Table 2-3

Great Western Chemical Company
Test Results - October 29, 1992

Sample Number[a]	Sample Location	Hazardous Constituent[b]	Results		Regulatory Levels	
			Total (mg/kg)	TCLP (mg/L)	DEQ Cleanup Level (ppm)[c]	TC Regulatory Level (mg/L)
Set 3-S6	T6	Arsenic	4	ND	3	5
		Chromium (T)	21	ND	1,500	5
		Chromium (+3)	21	NA	NA	NA
		Chromium (+6)	0	NA	NA	NA
		Copper	69	DNT	80,000	NA
		Lead	ND	DNT	2,000	5

NOTE: ND = not detected.
NA = not applicable.
DNT = did not test

[a] All samples were collected 24 inches below surface.
[b] Chromium (T) = Total Chromium; Chromium (+3) = Trivalent Chromium; Chromium (+6) = Hexavalent Chromium.
[c] Refer to DEQ's Environmental Cleanup Table (Industrial Soil Cleanup level), OAR 340-122-045.

Table 2-4

Great Western Chemical Company
Waste Profiles

Waste Name	Receiving Treatment, Storage, and Disposal Facility (TSDF)	Waste Classification and Code	Profile Number
Miscellaneous Debris	Waste Management of Oregon	Nonhazardous	89788
CCA Debris	Chemical Waste Management	Hazardous D004, D007	AL5856
CCA Soil	Chemical Waste Management	Hazardous D004, D007	BF2917
CCA Decon Liquid	Chemical Waste Management	Hazardous D004, D007	BF2918

Table 3-1

Test Results - December 14, 1992

Sample Number	Sample Description	Sample Depth	Sample Location	Hazardous Constituent	Results		DEQ Soclean Standards [c] Total Metals (mg/kg)	TC Rule Standards [d] (mg/L)
					Total (mg/kg) [a]	TCLP (mg/L) [b]		
CS-Chemax-2	Intermediate soil	30 inches	Cell 2	Arsenic	350	0.5	3	5
				Chromium	1,230	29.6	1,500	5
				Copper	145	1.52	80,000	
CS-Chemax-4	Intermediate soil	30 inches	Cell 4	Arsenic	613	0.7	3	5
				Chromium	4,110	61	1,500	5
				Copper	875	17.5	80,000	
CS-Chemax-7	Intermediate soil	30 inches	Cell 7	Arsenic	5,300	5.7	3	5
				Chromium	2,280	18.1	1,500	5
				Copper	1,360	18.2	80,000	
CS-Chemax-10	Intermediate soil	30 inches	Cell 10	Arsenic	76	ND	3	5
				Chromium	152	3.69	1,500	5
				Copper	80	0.22	80,000	
CS-Chemax-14	Intermediate soil	30 inches	Cell 14	Arsenic	49	ND	3	5
				Chromium	535	19.3	1,500	5
				Copper	29	0.14	80,000	
CS-Chemax-16	Intermediate soil	30 inches	Cell 16	Arsenic	5	ND	3	5
				Chromium	170	2.82	1,500	5
				Copper	18	0.02	80,000	

Table 3-1

Test Results - December 14, 1992

Sample Number	Sample Description	Sample Depth	Sample Location	Hazardous Constituent	Results		DEQ Soclean Standards [c] Total Metals (mg/kg)	TC Rule Standards [d] (mg/L)
					Total (mg/kg) [a]	TCLP (mg/L) [b]		
CS-Chemax-21	Intermediate soil	30 inches	Cell 21	Arsenic	77	ND	3	5
				Chromium	50	0.99	1,500	5
				Copper	71	0.12	80,000	
CS-Chemax-24	Intermediate soil	30 inches	Cell 24	Arsenic	6	ND	3	5
				Chromium	185	4.47	1,500	5
				Copper	22	0.03	80,000	
CS-Chemax-26	Intermediate soil	30 inches	Cell 26	Arsenic	4	ND	3	5
				Chromium	55	0.28	1,500	5
				Copper	15	ND	80,000	
CS-Chemax-35	Intermediate soil	30 inches	Cell 35	Arsenic	6	ND	3	5
				Chromium	21	0.02	1,500	5
				Copper	18	0.03	80,000	

NOTE: ND = not detected at the method reporting limit (MRL).
Total MRLs (mg/kg): Arsenic 20; Chromium 2; Copper 2.
TCLP MRLS (mg/L): Arsenic 0.1; Chromium 0.01.

[a] mg/kg = milligrams per kilogram or parts per million (ppm). Refer to TC DEQ Soclean Standards.
[b] mg/L = milligrams per liter or ppm. Refer to TC Rule Standards.
[c] OAR 340-122-045.
[d] 40 CFR § 261.24.

Table 3-2

Test Results - December 16, 1992

Sample Number	Sample Description	Sample Depth	Sample Location	Hazardous Constituent	Results		DEQ Soclean Standards Total Metals (mg/kg)	TC Rule Standards (mg/L)
					Total (mg/kg)[a]	TCLP (mg/L)[b]		
CS-Chemax-28	Intermediate soil	30 inches	Cell 28	Arsenic	4	ND	3	5
				Chromium	14	ND	1,500	5
				Copper	16	ND	80,000	NA
CS-Chemax-29	Intermediate soil	30 inches	Cell 29	Arsenic	46	0.1	3	5
				Chromium	42	0.43	1,500	5
				Copper	85	0.32	80,000	NA
Liquid Composite	Decon Water and Concentrated Liquid	NA	55 Gallon Drum	Arsenic	10,400	3,880	NA	5
				Chromium	12,700	5,070	NA	5
				Copper	7,170	2,660	NA	NA

NOTE: NA = not applicable.
ND = not detected at the method reporting limit (MRL).
Totals MRLs (mg/kg): Arsenic 20; Chromium 2; Copper 2.
TCLP MRLS (mg/L): Arsenic 0.1; Chromium 0.01.

[a] mg/kg = milligrams per kilogram or parts per million (ppm).
[b] mg/L = milligrams per liter or ppm.

Table 3-3

Test Results - December 23, 1992

Sample Number	Sample Description	Sample Depth	Sample Location	Hazardous Constituent	Results Total (mg/kg)[a]	DEQ Soclean Standards[b] Total Metals (mg/kg)
CS2-Chemax-1i	Intermediate soil	34 inches	Near Cell 1	Arsenic	2	3
				Chromium	21	1,500
				Copper	20	80,000
CS2-Chemax-1d	Deep soil	54 inches	Near Cell 1	Arsenic	2	3
				Chromium	142	1,500
				Copper	15	80,000
CS2-Chemax-4d	Deep soil	54 inches	Cell 4	Arsenic	2	3
				Chromium	62	1,500
				Copper	13	80,000
CS2-Chemax-6d	Deep soil	54 inches	Cell 6	Arsenic	2	3
				Chromium	55	1,500
				Copper	14	80,000
CS2-Chemax-7d	Deep soil	78 inches	Cell 7	Arsenic	6,370	3
				Chromium	11,000	1,500
				Copper	3,910	80,000
CS2-Chemax-9i	Intermediate soil	34 inches	Cell 9	Arsenic	6	3
				Chromium	1,390	1,500
				Copper	1,840	80,000
CS2-Chemax-9d	Deep soil	54 inches	Cell 9	Arsenic	8	3
				Chromium	532	1,500
				Copper	958	80,000

NOTE: ND = not detected at the method reporting limit (MRL).
Totals MRLs (mg/kg): Arsenic 20; Chromium 2; Copper 2.
TCLP MRLS (mg/L): Arsenic 0.1; Chromium 0.01.

[a] mg/kg = milligrams per kilogram or parts per million (ppm).
[b] OAR 340-122-045.

Table 3-4

Test Results - December 29, 1992

Sample Number	Sample Description	Sample Depth	Sample Location	Hazardous Constituent	Results Total (mg/kg)[a]	DEQ Soclean Standards[b] Total Metals (mg/kg)
CS3-Chemax-7d	Deep soil	108 inches	Cell 7	Arsenic	7,370	3
				Chromium	2,140	1,500
				Copper	2,730	80,000
Chemax-SW-West	Sidewall soil	18 inches	Cell 34	Arsenic	10	3
				Chromium	71	1,500
				Copper	40	80,000
Chemax-SW-South	Sidewall soil	18 inches	Cell 27	Arsenic	96	3
				Chromium	670	1,500
				Copper	245	80,000
Chemax-SW-East	Sidewall soil	18 inches	Cell 5	Arsenic	5,360	3
				Chromium	6,290	1,500
				Copper	1,560	80,000
Chemax-SW-North	Sidewall soil	18 inches	Cell 10	Arsenic	44	3
				Chromium	1,030	1,500
				Copper	71	80,000

[a] mg/kg = milligrams per kilogram or parts per million (ppm).
[b] OAR-340-122-045.

Table 3-5

Great Western Chemical Company
Test Results - December 30, 1992

Sample Number	Sample Description	Sample Depth	Sample Location	Hazardous Constituent	Results Total (mg/kg)	DEQ SoClean Standards [a] Total Metals (mg/kg)
BKG-Chemax-001	Intermediate soil	34 inches	cell 26	Arsenic	2	3
				Chromium	21	1,500
				Copper	13	80,000
BKG-Chemax-002	Intermediate soil	34 inches	cell 24	Arsenic	2	3
				Chromium	185	1,500
				Copper	11	80,000

[a] OAR-340-122-045.

Table 4-1

Great Western Chemical Company
Test Results From Drop Box Samples - April 27-30, 1993

Date Collected	Sample Number	Sample Description	Sample Location	Sample Depth (inches)	Hazardous Constituent	Results		Target Levels (TCLP) (mg/L)	Waste Status
						Total (mg/kg)	TCLP (mg/L)		
04/27/93	CMX3-BOX1-42793	Composite from drop box	6 locations in drop box	12	Arsenic	ND	ND	5	NH
					Chromium	73	0.48	5	
					Copper	38	0.53		
04/27/93	CMX3-BOX2-42793	Composite from drop box	6 locations in drop box	12	Arsenic	190	ND	5	H
					Chromium	1,110	7.83	5	
					Copper	628	9.46		
04/27/93	CMX3-BOX3-42793	Composite from drop box	6 locations in drop box	12	Arsenic	329	0.5	5	H
					Chromium	829	17.2	5	
					Copper	603	8.74		
04/27/93	CMX3-BOX4-42793	Composite from drop box	6 locations in drop box	12	Arsenic	306	0.2	5	H
					Chromium	824	18.2	5	
					Copper	518	7.96		
04/29/93	CMX3-BOX5-42993	Composite from drop box	6 locations in drop box	12	Arsenic	699	10	5	H
					Chromium	779	17.6	5	
					Copper	493	6.92		
04/29/93	CMX3-BOX6-42793	Composite from drop box	6 locations in drop box	12	Arsenic	419	0.5	5	H
					Chromium	419	6.7	5	
					Copper	328	3.29		

Table 4-1

Great Western Chemical Company
Test Results From Drop Box Samples - April 27-30, 1993

Date Collected	Sample Number	Sample Description	Sample Location	Sample Depth (inches)	Hazardous Constituent	Results		Target Levels (TCLP) (mg/L)	Waste Status
						Total (mg/kg)	TCLP (mg/L)		
04/29/93	CMX3-BOX7-42793	Composite from drop box	6 locations in drop box	12	Arsenic	21	ND	5	NH
					Chromium	131	1.4	5	
					Copper	47	0.19		
04/29/93	CMX3-BOX8-42793	Composite from drop box	6 locations in drop box	12	Arsenic	21	ND	5	NH
					Chromium	162	3.8	5	
					Copper	57	0.31		
04/30/93	CMX3-BOX9-	Composite from drop box	6 locations in drop box	12	Arsenic	28	ND	5	NH
					Chromium	89	1.26	5	
					Copper	42	—		
04/30/93	CMX3-BOX10-	Composite from drop box	6 locations in drop box	12	Arsenic	40	ND	5	NH
					Chromium	169	1.76	5	
					Copper	74	—	5	

NOTE: ND = not detected.
NH = nonhazardous.
H = hazardous waste.
— = not tested.
TCLP = toxicity characteristic leaching procedure.

Table 4-2

Great Western Chemical Company
Test Results From Soil Samples - April 22-30, 1993

Date Collected	Sample Number	Sample Description	Sample Location	Sample Depth (inches)	Hazardous Constituent	Results Total (mg/kg)	Target Cleanup Levels [a] (mg/kg)
04/22/93	CMX3-1B-42293	Bottom sample	Cell 1	108	Arsenic	ND	30
					Chromium	597	1,500
					Copper	560	80,000
04/22/93	CMX3-1SW-42293	Side wall sample	Cell 1	72	Arsenic	ND	30
					Chromium	524	1,500
					Copper	41	80,000
04/26/93	CMX3-3B-42693	Bottom sample	Cells 2 & 3	108	Arsenic	ND	30
					Chromium	794	1,500
					Copper	111	80,000
04/26/93	CMX3-3SW-42693	Side wall sample	Cells 2 & 3	72	Arsenic	ND	30
					Chromium	1,320	1,500
					Copper	2,020	80,000
04/22/93	CMX3-4B-42293	Bottom sample	Cell 4	144	Arsenic	28	30
					Chromium	598	1,500
					Copper	952	80,000
04/28/93	CMX3-5B-42893	Bottom sample	Cell 5	138	Arsenic	119	30
					Chromium	264	1,500
					Copper	596	80,000

Table 4-2

Great Western Chemical Company
Test Results From Soil Samples - April 22-30, 1993

Date Collected	Sample Number	Sample Description	Sample Location	Sample Depth (inches)	Hazardous Constituent	Results Total (mg/kg)	Target Cleanup Levels[a] (mg/kg)
04/26/93	CMX3-7B-42693	Bottom sample	Cells 6 & 7	174	Arsenic	68	30
					Chromium	119	1,500
					Copper	379	80,000
04/26/93	CMX3-7SW-42693	Side wall sample	Cells 6 & 7	72	Arsenic	ND	30
					Chromium	244	1,500
					Copper	1,300	80,000
04/22/93	CMX3-8B-42293	Bottom sample	Cell 8	168	Arsenic	ND	30
					Chromium	65	1,500
					Copper	20	80,000
04/22/93	CMX3-8SW-42293	Side wall sample	Cell 8	72	Arsenic	ND	30
					Chromium	33	1,500
					Copper	15	80,000
04/22/93	CMX3-9B-42293	Bottom sample	Cell 9	144	Arsenic	ND	30
					Chromium	62	1,500
					Copper	18	80,000
04/28/93	CMX3-55B-42893	Bottom sample	Cell 55	102	Arsenic	ND	30
					Chromium	25	1,500
					Copper	19	80,000

Table 4-2

Great Western Chemical Company
Test Results From Soil Samples - April 22-30, 1993

Date Collected	Sample Number	Sample Description	Sample Location	Sample Depth (inches)	Hazardous Constituent	Results Total (mg/kg)	Target Cleanup Levels[a] (mg/kg)
04/28/93	CMX3-55SW-42893	Side wall sample	Cell 55	72	Arsenic	ND	30
					Chromium	34	1,500
					Copper	16	80,000
04/26/93	CMX3-56B-42693	Bottom sample	Cell 56	102	Arsenic	ND	30
					Chromium	41	1,500
					Copper	17	80,000
04/30/93	CMX3-SC11, 12, 20, 21-43093	Surface composite after final scrape	Cells 11, 12, 20, 21	52	Arsenic	ND	30
					Chromium	15	1,500
					Copper	15	80,000
04/30/93	CMX3-SC13, 22, 23-43093	Surface composite after final scrape	Cells 13, 22, 23	52	Arsenic	ND	30
					Chromium	98	1,500
					Copper	15	80,000
04/30/93	CMX3-SC 25, 26, 27-43093	Surface composite after final scrape	Cells 25, 26, 27	52	Arsenic	ND	30
					Chromium	56	1,500
					Copper	15	80,000

NOTE: ND = not detectable at method reporting limits.

Arithmetic average of bottom samples for entire excavation area:			
	Arsenic	22.3	30
	Chromium	139.5	1,500
	Copper	176	80,000

[a] OAR-340-122-045(7) and proposed RCRA corrective action rules.

Table 4-3

Great Western Chemical Company
Test Results From Groundwater Samples - May 10-20, 1993

Date Collected	Sample Number	Well Number (Location)	Hazardous Constituent	Results		Regulatory[a] Levels (mg/L)
				Total (mg/L)	TCLP (mg/L)	
05/10/93	CMX3-1-51093	TMW-1 (cell 2)	Arsenic	ND	ND	0.05
			Chromium	0.446	0.077	0.1
			Copper	0.644	0.229	1.3
05/10/93	CMX3-2-51093	CHEM-2 (existing on-site well)	Arsenic	ND	ND	0.05
			Chromium	ND	ND	0.1
			Copper	0.734	0.512	1.3
05/10/93	CMX3-3-51093	TMW-2 (cell 7)	Arsenic	ND	ND	0.05
			Chromium	0.856	0.561	0.1
			Copper	1.520	0.870	1.3
05/11/93	CMX3-4-51193	TMW-1 (cell 2)	Arsenic	ND	ND	0.05
			Chromium	17.8	17	0.1
			Copper	0.828	0.746	1.3
05/11/93	CMX3-5-51193	TMW-2 (cell 7)	Arsenic	ND	ND	0.05
			Chromium	0.637	0.514	0.1
			Copper	0.952	0.846	1.3
05/17/93	CMX3-1-51793	TMW-1 (cell 2)	Arsenic	ND	ND	0.05
			Chromium	54.8	51.1	0.1
			Chromium (+3)	15.4	—	—
			Chromium (+6)	39.4	—	0.1
			Copper	5.26	5.25	1.3
05/20/93	CMX3-RW-52093	TMW-1 (cell 2)	Arsenic	0.588	0.2	0.05
			Chromium	—	14.9	0.1
			Copper	—	2.02	1.3

NOTE: mg/L = milligrams per liter or parts per million (ppm).
— = not tested.
ND = not detected.

[a] U.S. Environmental Protection Agency (USEPA) drinking water standards (MCLs). Ref.: Drinking Water Regulations and Health Advisories by USEPA Office of Water, December 1993.

Table 4-4

Great Western Chemical Company
Water Level Measurements
(ft)

Well No.	Top of Casing Elevation	Date Gauged	Water Level Below TOC	Water Elevation (Relative)
MW-1	99.20	05/11/93	15.56	83.64
TMW-1	99.89	05/11/93	16.17	83.72
TMW-2	100.13	05/11/93	16.04	84.09

NOTE: All elevations are based on the 100' reference point established by EMCON.

Table 5-1

Great Western Chemical Company
Monitoring Well Construction Summary

Well Location	Northings	Top of Casing Elevation (ft LD)	Casing Diameter (inches)	Borehole Diameter (inches)	Sand Pack Interval (feet bgs)	Slotted Interval (feet bgs)	Date Well Installed
MW-1[a]	856.5	99.20	2	NA	7-21.5	9.5-19.5	06/13/90
MW-2	876.0	99.34	2	10	15.5-28	17.5-27	10/01/93
MW-3	959.0	98.30	2	10	15-27.5	17.5-27	10/04/93
MW-4	1028.5	97.36	2	10	16-28	18-27.5	10/01/93
MW-5	1226.5	98.42	2	10	22.5-35.5	25.5-35	09/30/93
TMW-1	862.0	99.89	6/2[b]	[c]	[c]	15.8-18.5	05/06/93
TMW-2	839.0	100.00	6/2[b]	[c]	[c]	15.8-18.5	05/06/93

NOTE: All wells were installed by Geo-Tech Explorations, Inc. MW-1 through MW-5 were installed using a hollow stem auger drilling rig. TMW-1 and TMW-2 were installed by the backfilling of an open excavation around an 8 PVC casing and then driving a 2-inch-diameter well point past end of casing.

bgs = below ground surface.

LD = Local datum, which was established at the top of the easternmost bolt at the base of the fire hydrant in back of the Chemax building, near MW-3 (elevation 100 feet).

NA = Information is not available.

[a] Construction during a June 1990 investigation. Formerly named CHEM-2.

[b] Six-inch-diameter outer casing and 2-inch-diameter inner casing.

[c] Two-inch-diameter driven from 8 feet to 18.8 feet bgs for MW-1 and 11.5 feet to 18.8 feet bgs from MW-2.

Table 5-2

Great Western Chemical Company
Groundwater Level Measurements - May and October 1993

Well Number	TOC Elevation[a] (ft)	Date Gauged	Depth to Water Level (ft-BTOC)	Water Elevation[a] (ft)
MW-1	99.20	05/11/93	15.56	83.64
		10/18/93	17.04	82.16
		10/28/93	17.16	82.04
MW-2	99.34	10/18/93	16.63	82.71
		10/28/93	16.72	82.62
MW-3	98.30	10/18/93	16.47	81.83
		10/28/93	16.60	81.70
MW-4	97.36	10/18/93	16.21	81.15
		10/28/93	16.26	81.10
MW-5	98.42	10/18/93	20.13	78.29
		10/28/93	20.48	77.94
TMW-1	99.89	05/11/93	16.17	83.72
		05/20/93	15.97	83.92
		10/18/93	17.63	82.26
		10/28/93	17.74	82.15
TMW-2	100.13	05/11/93	16.04	84.09
		05/20/93	15.91	84.22
		10/18/93	17.40	82.73
		10/28/93	17.64	82.49
WG-1 (13:20)	100.93	10/28/93	32.82	68.11

NOTE: TOC = top of casing.
BTOC = below top of casing.
WG-1 = Willamette River gauge.

[a] All elevations are based on an arbitrary site datum with assumed elevation equal to 100.00 feet.

Table 5-3

Great Western Chemical Company
Groundwater Level Measurements
January 27, 1994

Well Number (Location)	TOC Elevation[a] (ft)	Date Gauged	Depth to Water Level (ft-BTOC)	Water Elevation[a] (ft)
MW-1	99.20	05/11/93	15.56	83.64
		10/18/93	17.04	82.16
		10/28/93	17.16	82.04
		01/27/94	16.99	82.21
MW-2	99.34	10/18/93	16.63	82.71
		10/28/93	16.72	82.62
		01/27/94	16.56	82.78
MW-3	98.30	10/18/93	16.47	81.83
		10/28/93	16.60	81.70
		01/27/94	16.40	81.90
MW-4	97.36	10/18/93	16.21	81.15
		10/28/93	16.26	81.10
		01/27/94	16.06	81.30
MW-5	98.42	10/18/93	20.13	78.29
		10/28/93	20.48	77.94
		01/27/94	19.89	78.53
TMW-1	99.89	05/11/93	16.17	83.72
		05/20/93	15.97	83.92
		10/18/93	17.63	82.26
		10/28/93	17.74	82.15
		01/27/94	17.46	82.43
TMW-2	100.13	05/11/93	16.04	84.09
		05/20/93	15.91	84.22
		10/18/93	17.40	82.73
		10/28/93	17.64	82.49
		01/27/94	17.58	82.55
WG-1 (13:20)	100.93	10/28/93	32.82	68.11
		01/27/94	30.04	70.89

NOTE: TOC = top of casing.
BTOC = below top of casing.
WG-1 = Willamette River gauge.

[a] All elevations are based on an arbitrary site datum with assumed elevation equal to 100.00 feet.

Table 5-4

Great Western Chemical Company
Test Results From Groundwater Samples and Drill Cuttings
Collected on October 13 and 18, 1993

Date Collected	Sample Number	Well Number	Well Location	Constituent	Results		Regulatory * Standard (mg/L)
					Total (mg/L)	MRL (mg/L)	
10/13/93	CMX-101393-1	MW-1	Corner of warehouse near former copper sulfate pit	Arsenic	ND	0.005	0.05
				Chromium	0.007	0.005	0.1
				Copper	4.370	0.010	1.3
10/13/93	CMX-101393-7	MW-2	Loading dock	Arsenic	ND	0.005	0.05
				Chromium	2.870	0.005	0.1
				Copper	0.023	0.010	1.3
10/13/93	CMX-101393-2	MW-3	North of maintenance shop	Arsenic	0.028	0.005	0.05
				Chromium	0.006	0.005	0.1
				Copper	0.016	0.010	1.3
10/13/93	CMX-101393-4	MW-4	Approx. 100' north of maintenance shop near property line	Arsenic	ND	0.005	0.05
				Chromium	0.009	0.005	0.1
				Copper	ND	0.010	1.3

Table 5-4

Great Western Chemical Company—Tech Center
Test Results From Groundwater Samples and Drill Cuttings
Collected on October 13 and 18, 1993

Date Collected	Sample Number	Well Number	Well Location	Hazardous Constituent	Results			Regulatory[a] Levels (mg/L)
					Total (mg/L)	TCLP (mg/L)	MRL (mg/L)	
10/13/93	CMX-101393-5	MW-5	Approx. 300' north of maintenance shop near property line	Arsenic	ND	--	0.005	0.05
				Chromium	0.012	--	0.1	0.1
				Copper	ND	--	1.3	1.3
10/13/93	CMX-101393-DCS	Drill cuttings composite	NA	Arsenic	--	ND	0.5	5.0
				Chromium	--	ND	0.05	5.0[b]
				Copper	--	ND	0.05	NA
10/18/93	CMX-101893-8	TMW-1	Cell 2 (indoors)	Arsenic	ND	--	0.005	0.05
				Chromium	ND	--	0.005	0.1
				Copper	0.072	--	0.010	1.3
10/13/93	CMX-101393-6	TMW-2	Cell 7 (indoors)	Arsenic	ND	--	0.005	0.05
				Chromium	ND	--	0.005	0.1
				Copper	0.119	--	0.010	1.3

NOTE: -- = not tested.
NA = not applicable.
ND = not detected.
TCLP = toxicity characteristic leaching procedure.
MRL = method reporting limit.

[a] USEPA drinking water standards, or MCLs established in December 1993.
[b] Threshold concentration for exhibiting characteristic of toxicity (Ref: 40 CFR 261.24).

Table 5-5

Great Western Chemical Company
Test Results From Groundwater Samples
Collected on October 26, 1993

Date Collected	Sample Number	Well Number	Well Location	Hazardous Constituent	Results		Regulatory* Levels (mg/L)
					Total (mg/L)	MRL (mg/L)	
10/26/93	CMX-102693-4	MW-1	Corner of warehouse near former copper sulfate pit	Arsenic	ND	0.005	0.05
				Chromium	ND	0.005	0.1
				Copper	3.18	0.010	1.3
10/26/93	CMX-102693-6	MW-2	Loading dock	Arsenic	ND	0.005	0.05
				Chromium	ND	0.005	0.1
				Copper	ND	0.010	1.3
10/26/93	CMX-102693-2	MW-3	North of maintenance shop	Arsenic	0.032	0.005	0.05
				Chromium	ND	0.005	0.1
				Copper	ND	0.010	1.3
10/26/93	CMX-102693-1	MW-4	Approximately 100' north of maintenance shop near property line	Arsenic	ND	0.005	0.05
				Chromium	ND	0.005	0.1
				Copper	ND	0.010	1.3
10/26/93	CMX-102693-3	MW-5	Approx. 300' north of maintenance shop near property line	Arsenic	ND	0.005	0.05
				Chromium	ND	0.005	0.1
				Copper	ND	0.010	1.3
10/26/93	CMX-102693-5	TMW-1	Cell 2 (indoors)	Arsenic	ND	0.005	0.05
				Chromium	ND	0.005	0.1
				Copper	0.018	0.010	1.3

Table 5-5

Great Western Chemical Company
Test Results From Groundwater Samples
Collected on October 26, 1993

Date Collected	Sample Number	Well Number	Well Location	Hazardous Constituent	Results		Regulatory[a] Levels (mg/L)
					Total (mg/L)	MRL (mg/L)	
10/26/93	CMX-102693-7	TMW-2	Cell 7 (indoors)	Arsenic	ND	0.005	0.05
				Chromium	ND	0.005	0.1
				Copper	0.088	0.010	1.3

NOTE: – = not tested.
ND = not detected.
TCLP = toxicity characteristic leaching procedure.
MRL = method reporting limit.

[a] U.S. Environmental Protection Agency drinking water standards, or MCLs established in December 1993.

Table 5-6

Great Western Chemical Company
Test Results From Groundwater Samples Collected on January 27, 1994

Well Number	Well Location	Sample Name	Date Collected	Results		
				Arsenic (mg/L)	Chromium (mg/L)	Copper (mg/L)
MW-1	Corner of warehouse near former copper sulfate pit	MW-1-0127 MW-D-0127[a]	01/27/94 01/27/94	ND ND	ND ND	0.54 0.585
MW-2	Loading dock	MW-2-0127	01/27/94	0.018	ND	ND
MW-3	North of maintenance shop	MW-3-0127	01/27/94	0.033	ND	ND
MW-4	Approximately 100' north of maintenance shop near property line	MW-4-0127	01/27/94	ND	ND	ND
MW-5	Approximately 300' north of maintenance shop near property line	MW-5-0127	01/27/94	0.008	ND	ND
TMW-1	Cell 2 (indoors)	TMW-1-0127	01/27/94	ND	ND	ND
TMW-2	Cell 7 (indoors)	TMW-2-0127	01/27/94	ND	ND	0.045
		MRL MCL		0.005 0.05	0.005 0.1	0.010 1.3

NOTE: ND = not detected.
Method reporting limit (MRL) for arsenic, chromium, and copper is 5 parts per billion (ppb), 5 ppb, and 10 ppb, respectively.
[a] Duplicate sample collected from well MW-1.

Table 5-7

Great Western Chemical Company
Summary of Test Results for Groundwater Samples Collected From 1990 to 1994

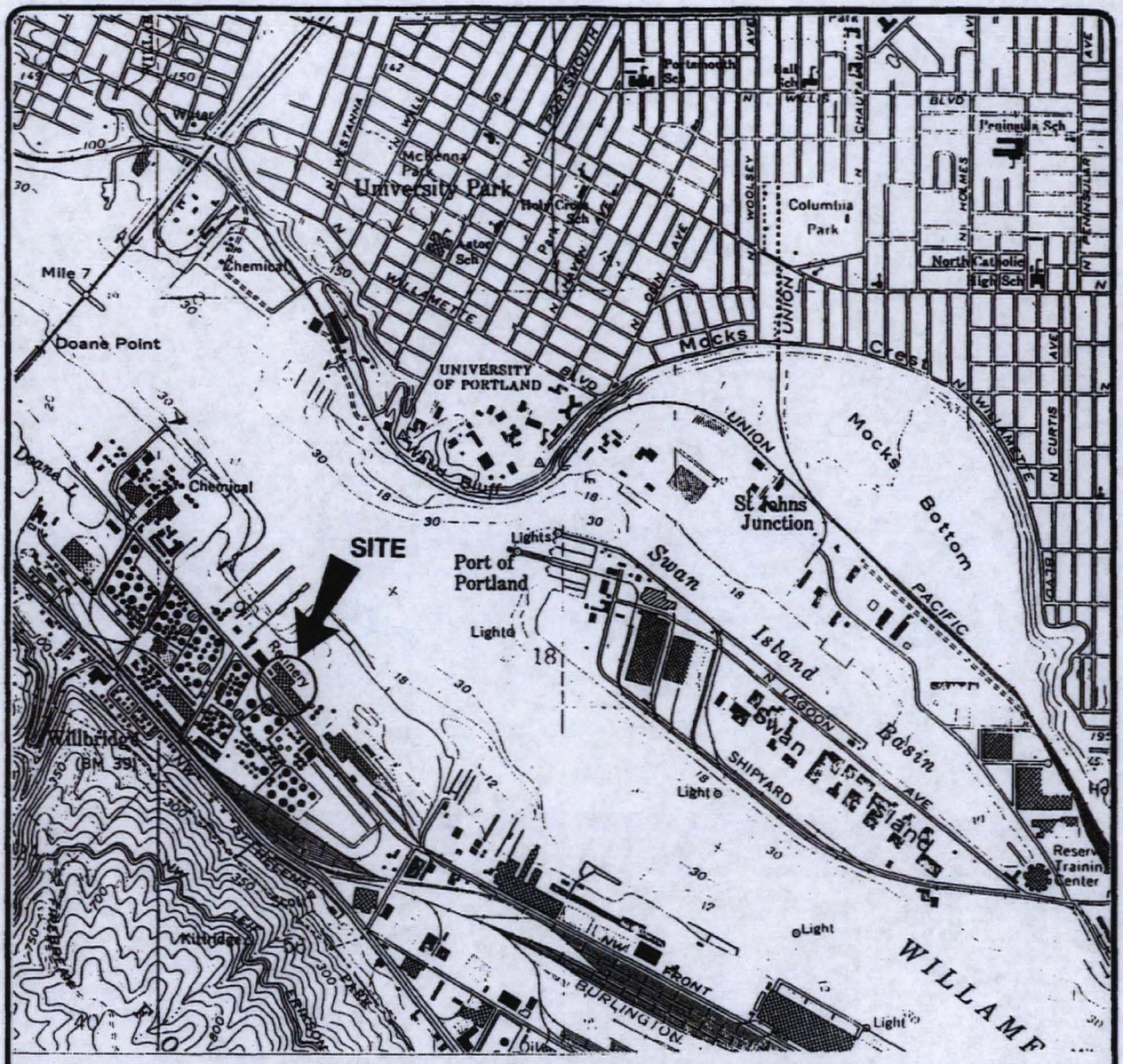
Well No.	Sample Name	Date	Arsenic µg/L (ppb)		Chromium µg/L (ppb)		Copper µg/L (ppb)	
			Total	Dissolved	Total	Dissolved	Total	Dissolved
MW-1	CHEM-2WF	06/12/90	--	9	--	5U	--	10 U
	CMX3-2-51093	05/10/93	5U	5U	5U	5U	734	512
	CMX-101393-1	10/13/93	--	5U	--	7	--	4,370
	CMX-102693-4	10/26/93	--	5U	--	5U	--	3,180
	MW-1-0127	01/27/94	--	5U	--	5U	--	540
MW-2	CMX-101393-7	10/13/93	--	5U	--	2,870	--	23
	CMX-102693-6	10/26/93	--	5U	--	5U	--	10 U
	MW-2-0127	01/27/94	--	18	--	5U	--	10 U
MW-3	CMX-101393-2	10/13/93	--	28	--	6	--	16
	CMX-102693-2	10/26/93	--	32	--	5U	--	10 U
	MW-3-0127	01/27/94	--	33	--	5U	--	10 U
MW-4	CMX-101393-4	10/13/93	--	5U	--	9	--	10 U
	CMX-102693-1	10/26/93	--	5U	--	5U	--	10 U
	MW-4-0127	01/27/94	--	5U	--	5U	--	10 U
MW-5	CMX-101393-5	10/13/93	--	5U	--	12	--	10 U
	CMX-102693-3	10/26/93	--	5U	--	5U	--	10 U
	MW-5-0127	01/27/94	--	8	--	5U	--	10 U

Table 5-7

Great Western Chemical Company
Summary of Test Results for Groundwater Samples Collected From 1990 to 1994

Well No.	Sample Name	Date	Arsenic µg/L (ppb)		Chromium µg/L (ppb)		Copper µg/L (ppb)	
			Total	Dissolved	Total	Dissolved	Total	Dissolved
TMW-1	CMX3-1-51093	05/10/93	5U	5U	446	77	644	229
	CMX3-4-51193	05/11/93	5U	5U	17,800	17,000	828	746
	CMX3-1-51793	05/17/93	5U	5U	54,800	51,100	5,260	5,250
	CMX3-RW-52093	05/20/93	588	200	--	14,900	--	2,020
	CMX-101893-8	10/18/93	--	5U	--	5U	--	72
	CMX-102693-5	10/26/93	--	5U	--	5U	--	18
	TMW-1-0127	01/27/94	--	5U	--	5U	--	10 U
TMW-2	CMX3-3-51093	05/10/93	5U	5U	856	561	1,520	870
	CMX5-5-51193	05/11/93	5U	5U	637	514	952	846
	CMX-101393-6	10/13/93	--	5U	--	5U	--	119
	CMX-102693-7	10/26/93	--	5U	--	5U	--	88
	TMW-2-0127	01/27/94	--	5U	--	5U	--	45

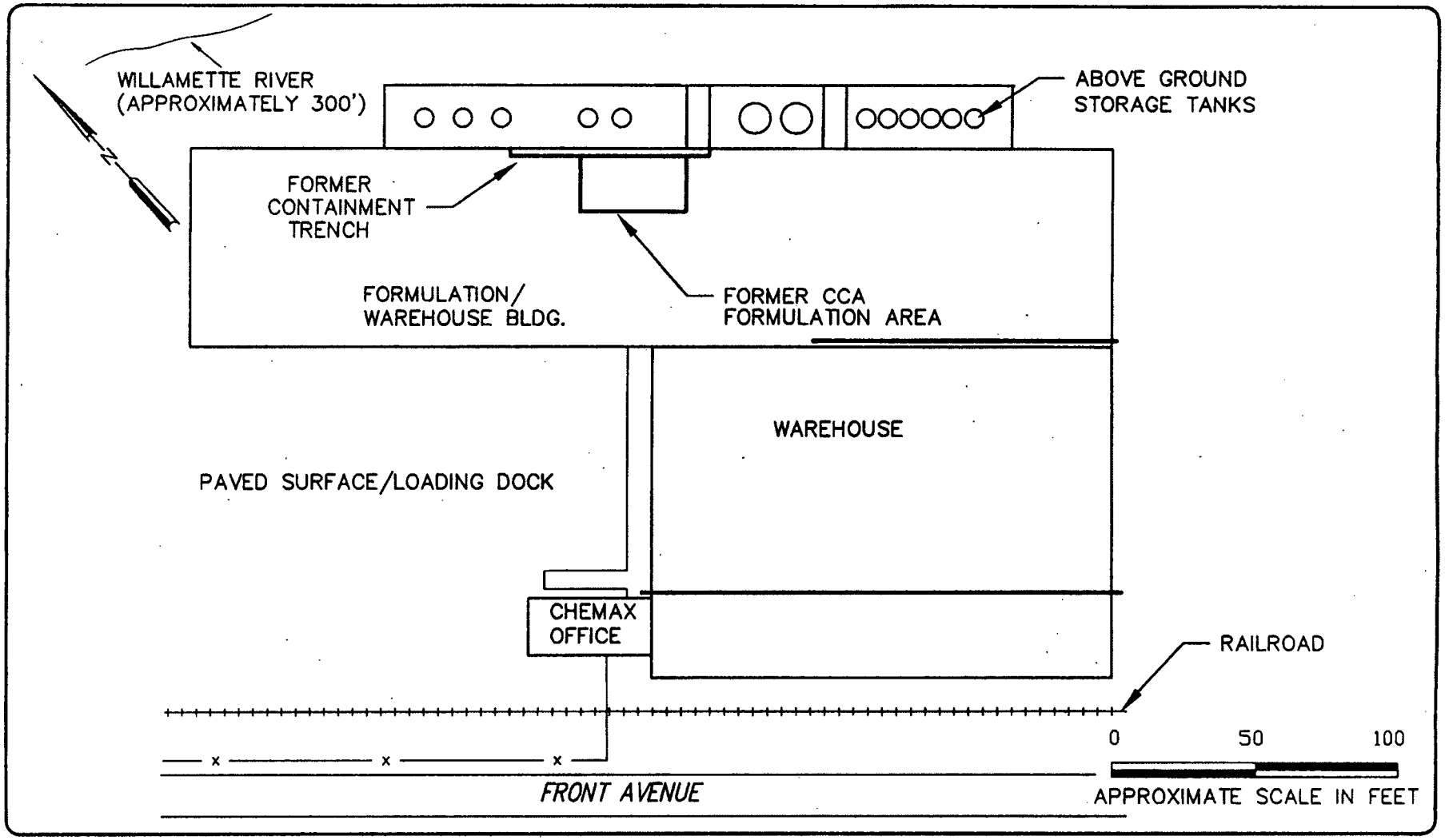
NOTE: Results reported in micrograms per liter.
U = Undetected above indicated value where detection was less than ten times the concentration detected in the blanks.
– = Not analyzed.
DEQ groundwater reference concentration of 0.04 µg/L for arsenic, 100 µg/L for chromium, and 1,300 µg/L for copper (see OAR-340122045).



EMCON Northwest, Inc.

DATE 11/92
DWN. VT
APPR. DES
REVIS. 3/94
PROJECT NO. 023501 0.03

Figure 1-1
GREAT WESTERN CHEMICAL COMPANY
TECHNICAL CENTER
PORTLAND, OREGON
SITE LOCATION MAP



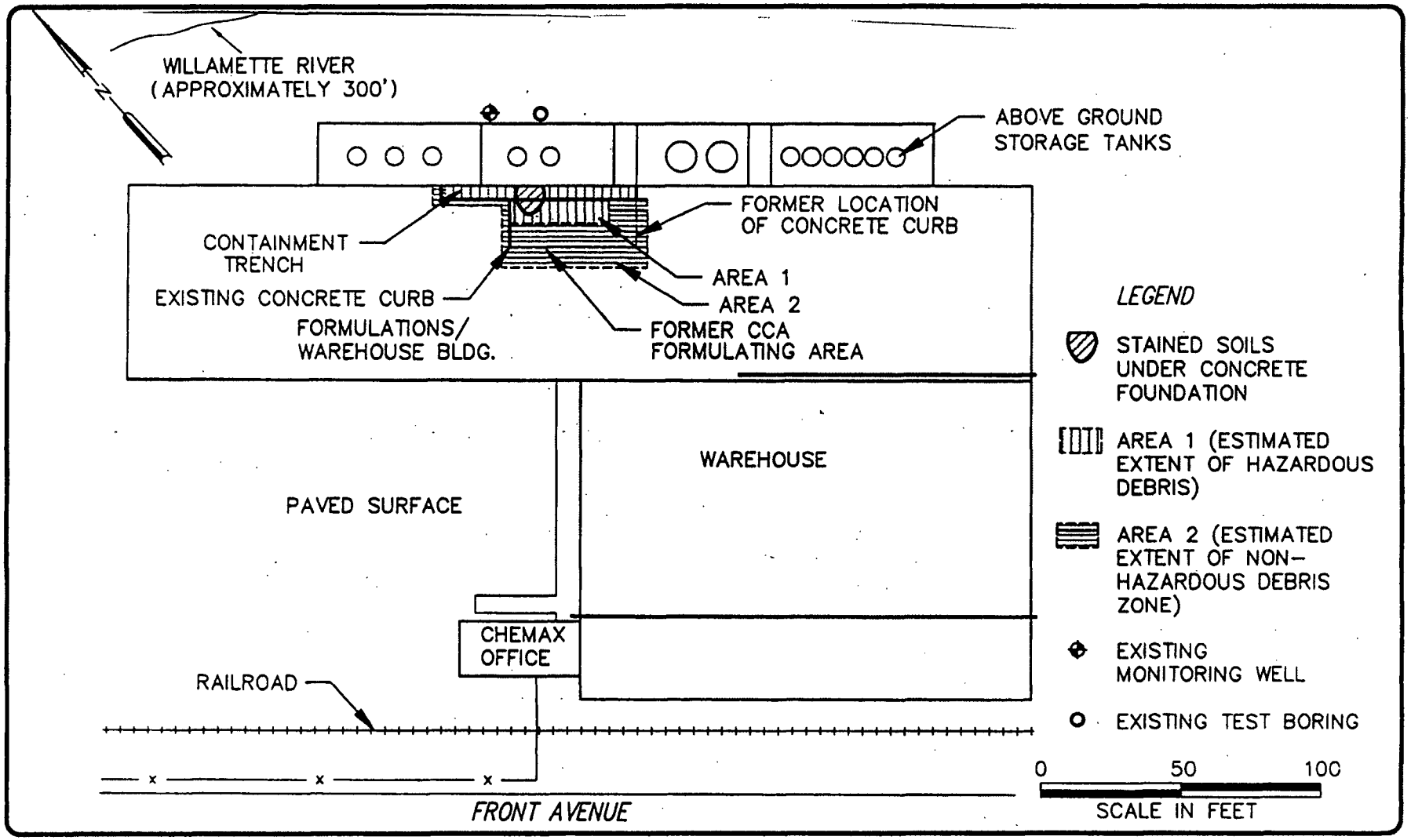
EMCON Northwest, Inc.

DATE 3/94
DWN. JTB
APPR. SAJ
REVIS. 10/93
PROJECT NO.
0235010.03

Figure 1-2
GREAT WESTERN CHEMICAL COMPANY
TECHNICAL CENTER

FACILITY MAP

G:\0235\007\03P3F-3/24/94-J

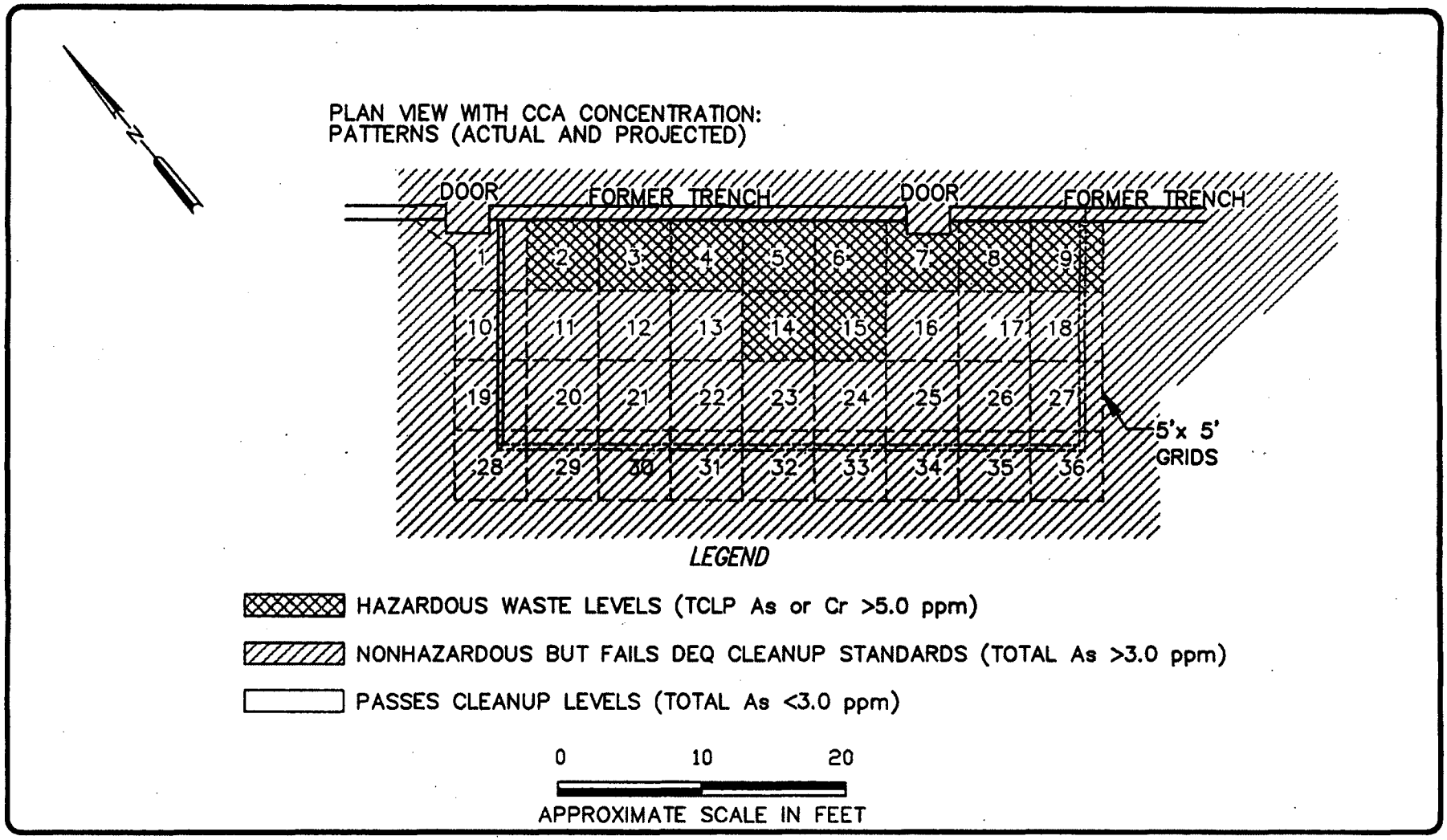


emcon
Northwest, Inc.

DATE 2-93
DWN. JTB
APPR. BRJ
REVIS.
PROJECT NO.
0235010.03

Figure 3-1
GREAT WESTERN CHEMICAL CO.
TECHNICAL CENTER

INTERMEDIATE EXCAVATION MAP



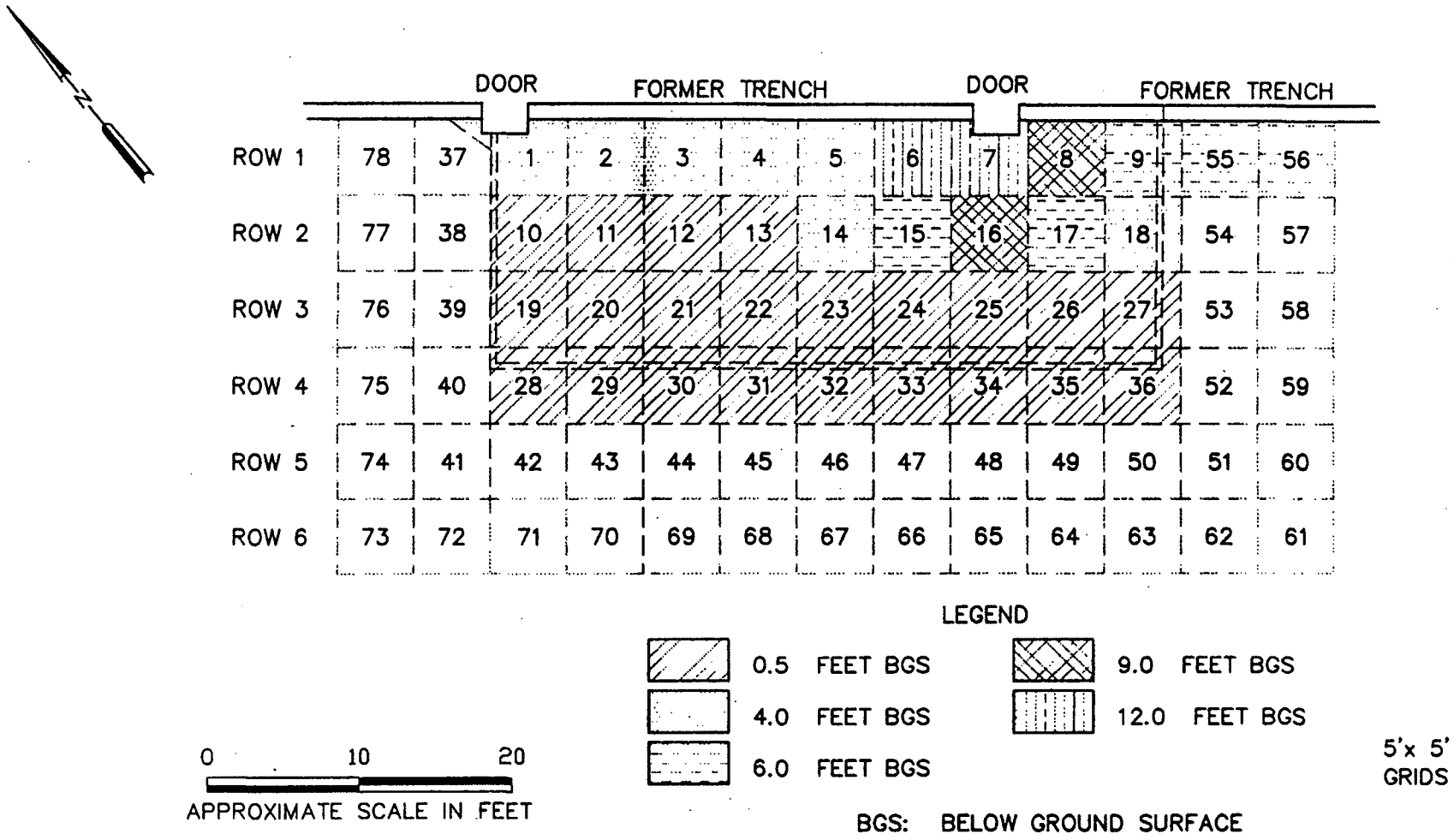
EMCON Northwest, Inc.

DATE 1/93
DWN. JTB
APPR. DRJ
REVIS.
PROJECT NO.
0235007.04

Figure 3-2
GREAT WESTERN CHEMICAL COMPANY
TECHNICAL CENTER

CCA CONSTITUENTS IN SOIL (18" LEVEL)

J:\0235\007\04GW1-1/14/93-J



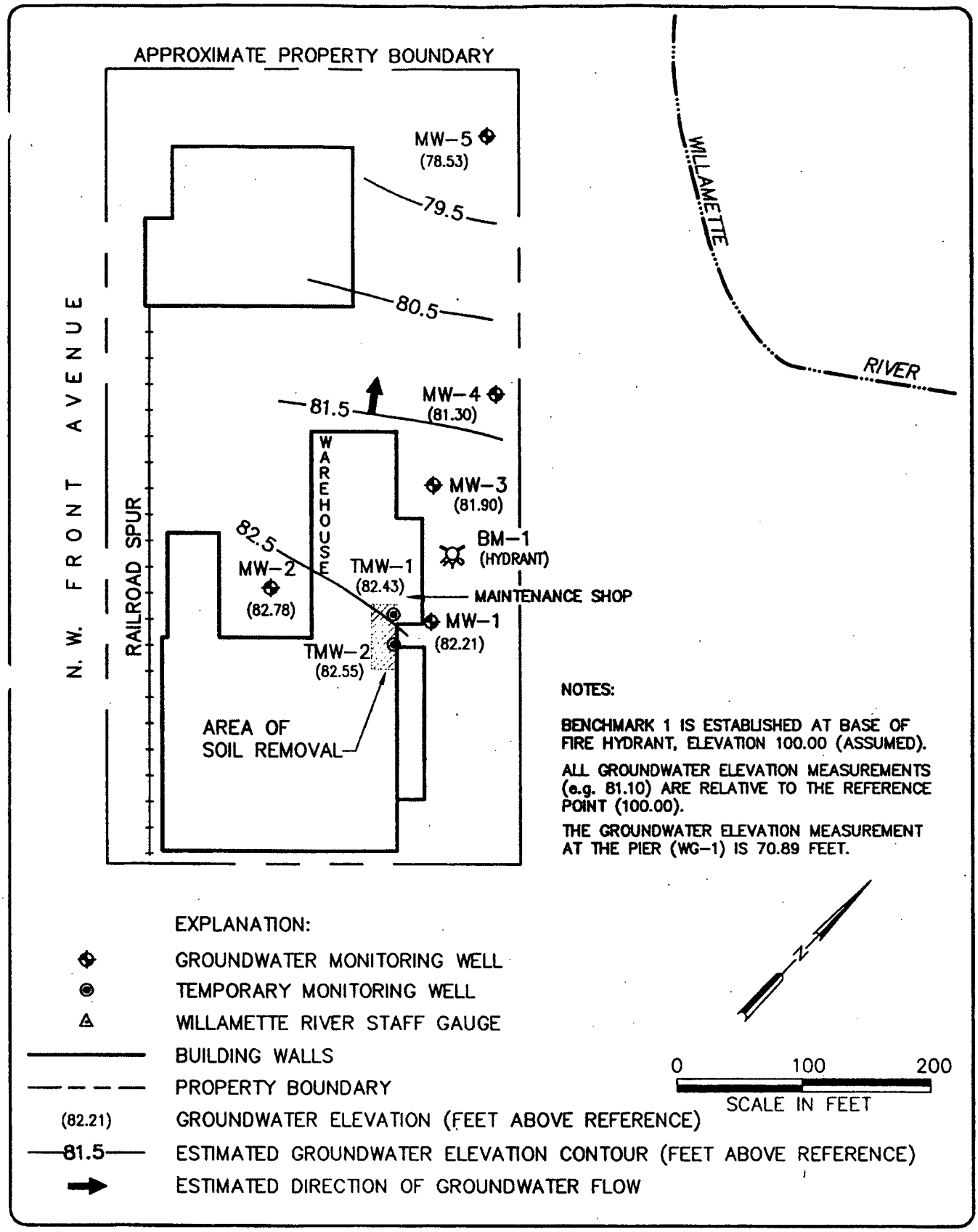
EMCON Northwest, Inc.

DATE 3/94
DWN. REH
APPR. BRJ
REVIS. 10/93
PROJECT NO.
0235007.04

Figure 4–1
GREAT WESTERN CHEMICAL COMPANY
TECHNICAL CENTER

SOIL REMOVAL PLAN - PLAN VIEW

G:DWG\0235\007\04P3-3/30/94-J



EMCON Northwest, Inc.

DATE 3/94
DWN. MMM
APPR. BRS
REVIS.
PROJECT NO. 0235010.03

Figure 5-2
GREAT WESTERN CHEMICAL COMPANY
TECHNICAL CENTER
ESTIMATED GROUNDWATER CONTOUR MAP
JANUARY 27, 1994

APPENDIX A

MATERIAL SAFETY DATA SHEET

CHEMAX

MATERIAL SAFETY DATA SHEET

NFPA 704 DESIGNATION
HAZARD RATING

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

3	- Health
0	- Fire
1	- Reactivity
COR/OXY	- Special

PRODUCT NAME: CCA* Type C: 50%	(* Chromated Copper Arsenate)
CHEMICAL NAME: N/A	CHEMICAL FAMILY: Metalic Wood Preservatives
FORMULA: Proprietary	MOLECULAR WEIGHT: N/A
D.O.T. SHIPPING CLASSIFICATION: Corrosive Liquid, Poisonous, N.O.S. UN-2922	

I. PHYSICAL DATA

BOILING POINT 760 mm. Hg	> 212 deg. F.	FREEZING POINT	- 30 deg. C.
SPECIFIC GRAVITY (WATER = 1)	1.64 @ 20 deg. C.	pH of 1% (w/v) SOLUTION	2.5
PERCENT VOLATILE ORGANICS BY VOLUME	N/A	SOLUBILITY IN WATER	Complete
APPEARANCE AND ODOR	Clear, very dark brown/black, heavy liquid with no odor.		

II. HAZARDOUS INGREDIENTS

MATERIAL	HAZARD	%	ACGIH TLV (Units)	OSHA PEL
Copper (II) Oxide; CAS #1317-38-0	Inhalation	8.5 - 10	AIR: 1 mg (Cu)/ cu.m.	AIR: TWA 1 mg (Cu)/cu.m.
Chromic Acid; CAS #7738-94-5	Corrosive/ Oxidizer/ Possible Carcinogen	25 +/- 5	AIR: TWA 25ug (Cr (VI))/ cu.m. CL: 50 ug/ cu.m./15M	AIR: CL 100 ug (Cr03)/cu.m.
O-Arsenic Acid; CAS #7778-39-4	Toxic/Corrosive (A Human Carcinogen)	20 +/- 5	AIR: 0.2 mg (As)/cu.m. [Recommended Std. CL 2ug (As/ cu.m./ 15M]	AIR: TWA 10 ug (As)/cu.m.

EMERGENCY PHONE NUMBERS

503/227-1616
CHEMAX

800/424-9300
CHEMTREC

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method(s))	N/A			AUTOIGNITION TEMPERATURE	N/A
FLAMMABLE LIMITS IN AIR, % by volume		LOWER	N/A	UPPER	N/A
EXTINGUISHING MEDIA	Water, foam, carbon dioxide and dry chemicals.				
UNUSUAL FIRE AND EXPLOSION HAZARDS	Contains a strong oxidizer; contact with combustables may initiate or promote combustion. May produce hazardous fumes or hazardous decomposition products. Water solutions are toxic and corrosive.				
SPECIAL FIRE FIGHTING PROCEDURES	When fire fighting, wear full protective equipment including self-contained breathing apparatus.				

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	Not established on this product.		
ROUTE OF EXPOSURE	EYE CONTACT "Danger" Corrosive	SKIN CONTACT "Danger" Corrosive	SKIN ABSORPTION Harmful when absorbed through the skin
	INHALATION Harmful if inhaled	INGESTION Harmful if swallowed	
EFFECTS OF OVEREXPOSURE	Causes severe eye and skin irritation or burns. Harmful or fatal if swallowed, inhaled or absorbed through skin.		

EMERGENCY AND FIRST AID PROCEDURES

EYES: Immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Call a physician immediately.

EXTERNAL: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. If burn or irritation occurs, call a physician.

INTERNAL: If swallowed, do NOT induce vomiting. Immediately drink a large quantity of milk or water and call a physician. Never give anything by mouth to an unconscious person.

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

PRODUCT NAME: **CCA Type C: 50%**

CHRONIC EXPOSURE EFFECTS	Repeated exposure can produce disturbances of the digestive system, blood, liver, kidney & nervous sys. & result in increased risk of cancer.

V. REACTIVITY DATA

STABILITY				CONDITIONS TO AVOID	
UNSTABLE		STABLE	X		None

INCOMPATIBILITY (materials to avoid)	Easily oxidizable organic liquids and solids, alkalies and reactive metals (i.e. aluminum, magnesium and zinc etc.)
HAZARDOUS DECOMPOSITION PRODUCTS	When heated to decomposition, it emits toxic oxides of chromium, arsenic and copper. May form toxic arsine gas (AsH3) when in contact with reducing agents or metals.

HAZARDOUS POLYMERIZATION				CONDITIONS TO AVOID	
MAY OCCUR		WILL NOT OCCUR	X		None

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Only a suitably-trained and protected persons should approach a spill. First, contain the spill; for small spills and dry material to contain. Then, wearing all recommended protective equipment, carefully add lime or sodium carbonate to neutralize acid. Pick up and containerize residues for disposal. Flush spill area with water and collect rinsates for disposal. All chromium and arsenic salts are hazardous and must be disposed of properly, observing all federal, state and local laws and regulations.
WASTE DISPOSAL METHOD	This product, if disposed as shipped, meets EPA criteria of a hazardous waste as specified in 40 CFR 261 on the basis of its corrosivity. Dispose of product in a licensed hazardous waste disposal facility in accordance with all applicable laws. When empty, thoroughly rinse container with water before disposal, return to manufacturer or any other industrial use. NOTE: Rinsates from drum washing are hazardous and must be disposed of properly, observing all federal, state and local laws and regulations. TREATMENT OF CONTAMINATED SOIL: Apply a chemical neutralizer (lime/ sodium dithionate mixture (10:1)] to render product water-insoluble. (A builders lime or cement with sodium dithionate can be used.) Mix sufficiently to convert all yellow/orange color in soil to green, then dig/scrape all green tainted soil into safe containers for treatment or removal as a hazardous waste.

PRODUCT NAME: CCA Type C: 50%

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)		If product spray or dust is possible, wear a full face NIOSH approved respirator, complying with 29 CFR 1910.134.		
VENTILATION	LOCAL EXHAUST	Manditory	SPECIAL	None
	MECHANICAL (general)	As suppliment only	OTHER	N/A
PROTECTIVE GLOVES		Rubber (recommend applying a Barrier Cream to hands & wrists before wearing gloves).		
EYE PROTECTION		Chemical goggles and full face shield.		
OTHER PROTECTIVE EQUIPMENT		Complete acid proof clothing to cover entire body, head, arms & legs; with an acid proof cap or hard hat & rubber boots.		

VIII. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

FOR INDUSTRIAL USE ONLY.
DANGER! Contains a known carcinogen.
Do not get product in eys, on skin or on clothing.
Keep container tightly closed when not in use.
Wash thoroughly with soap and water after handling.
This product is toxic to fish and wildlife.
Do not contaminate water by cleaning of equipment or disposal of wastes.
It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
EPA Reg. No. 47097-3.

OTHER HANDLING AND STORAGE CONDITIONS

Store only in containers approved for this purpose and do not store containers near heat or open flame.
NOTE: Only properly trained personnel may work with or handle this product.

PREPARED BY	Edward Doherty	DATE	05/06/87

APPENDIX B

LABORATORY TEST RESULTS FROM SOIL SAMPLES COLLECTED ON SEPTEMBER 23, 1992

Columbia Analytical Services, Inc.

September 28, 1992

Brent Jorgensen
EMCON Northwest, Inc.
15055 SW Sequoia Parkway
Suite 140
P.O. Box 231269
Portland, OR 97224

Re: **Great Western - CHEMAX/Project #0235-000.00**

Dear Brent:

Enclosed are the results of the rush samples submitted to our lab on September 23, 1992. Preliminary results were transmitted via facsimile on September 25, 1992. For your reference, these analyses have been assigned our work order number K925884.

All analyses were performed in accordance with our laboratory's quality assurance program. Reproduction of reports is allowed only in whole, not in part. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Dave Edmonson
for Charles R. Morrow
Project Chemist

CRM/eaw

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	09/23/92
Project:	Great Western - CHEMAX/#0235-000.00	Date Analyzed:	09/23/92
Sample Matrix:	Soil	Work Order No.:	K925884

Solids, Total
EPA Method Modified 160.3
Percent (%)

Sample Name	Lab Code	Result
CHEMAX-003	K5884-3	86.6

00091

Approved by Dave Erickson Date 9/25/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	09/23/92
Project:	Great Western - CHEMAX/#0235-000.00	Date Analyzed:	09/23/92
Sample Matrix:	Miscellaneous	Work Order No.:	K925884

Cyanide, Total
EPA Method 9010
mg/Kg (ppm)
As Received Basis

Sample Name	Lab Code	MRL	Result
CHEMAX-001	K5884-1	0.5	ND
CHEMAX-002	K5884-2	0.5	ND
Method Blank	K5884-MB	0.5	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

00092

Approved by Dave Fiedler Date 9/25/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	09/23/92
Project:	Great Western - CHEMAX/#0235-000.00	Date Analyzed:	09/23/92
Sample Matrix:	Soil	Work Order No.:	K925884

Cyanide, Total
EPA Method 9010
mg/Kg (ppm)
As Received Basis

Sample Name	Lab Code	MRL	Result
CHEMAX-003	K5884-3	0.5	1.0
Method Blank	K5884-MB	0.5	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

00003

Approved by Dave Erickson Date 9/25/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	09/23/92
Project:	Great Western - CHEMAX/#0235-000.00	Date TCLP Performed:	09/23/92
Sample Matrix:	Miscellaneous	Date Analyzed:	09/24/92
		Work Order No.:	K925884

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

		Sample Name:		CHEMAX-001	CHEMAX-002
		Lab Code:		K5884-1	K5884-2
Analyte	EPA Method	MRL	Regulatory Limit♦		
Arsenic	3010/6010	0.1	5.0	27.8	46.5
Barium	3010/6010	0.5	100	ND	ND
Cadmium	3010/6010	0.01	1.0	ND	ND
Chromium	3010/6010	0.01	5.0	142	347
Lead	3010/6010	0.05	5.0	ND	ND
Mercury	7470	0.001	0.2	0.001	0.001
Selenium	3010/6010	0.1	1.0	ND	ND
Silver	3010/6010	0.01	5.0	ND	ND

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Dave Early Date 9/25/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	09/23/92
Project:	Great Western - CHEMAX/#0235-000.00	Date TCLP Performed:	09/23/92
Sample Matrix:	Soil	Date Analyzed:	09/24/92
		Work Order No.:	K925884

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

				Sample Name:	CHEMAX-003	Method Blank
				Lab Code:	K5884-3	K5884-MB
Analyte	EPA Method	MRL	Regulatory Limit♦			
Arsenic	3010/6010	0.1	5.0		20.9	ND
Barium	3010/6010	0.5	100		ND	ND
Cadmium	3010/6010	0.01	1.0		ND	ND
Chromium	3010/6010	0.01	5.0		318	ND
Lead	3010/6010	0.05	5.0		ND	ND
Mercury	7470	0.001	0.2		ND	ND
Selenium	3010/6010	0.1	1.0		ND	ND
Silver	3010/6010	0.01	5.0		ND	ND

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Doris Erickson Date 9/25/92

00005

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	Date Received:	09/23/92
Project:	Great Western - CHEMAX/#0235-000.00	Date TCLP Performed:	09/23/92
Sample Matrix:	Miscellaneous	Date Analyzed:	09/24/92
		Work Order No.:	K925884

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

Sample Name: CHEMAX-001
Lab Code: K5884-1

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery♦
Arsenic	5.0	27.8	32.7	98
Barium	5.0	ND	5.0	100
Cadmium	1.0	ND	0.90	90
Chromium	5.0	142	145	*NA
Lead	5.0	ND	4.39	88
Mercury	0.010	0.001	0.011	100
Selenium	1.0	ND	1.1	110
Silver	1.0	ND	0.94	94

♦ Percent recovery information is provided in order to assess the performance of the method on this matrix.
ND None Detected at or above the method reporting limit
NA Not Applicable because of the sample matrix. Accuracy of the spike recovery value is reduced, since the sample concentration was greater than four times the amount spiked.

Approved by Dave Erickson Date 9/25/92

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	Date Received:	09/23/92
Project:	Great Western - CHEMAX/#0235-000.00	Date TCLP Performed:	09/23/92
Sample Matrix:	Soil	Date Analyzed:	09/24/92
		Work Order No.:	K925884

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

Sample Name: CHEMAX-003
Lab Code: K5884-3

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery♦
Arsenic	5.0	20.9	25.8	98
Barium	5.0	ND	5.2	104
Cadmium	1.0	ND	0.92	92
Chromium	5.0	318	313	*NA
Lead	5.0	ND	4.5	90
Mercury	0.010	ND	0.011	110
Selenium	1.0	ND	1.1	110
Silver	1.0	ND	0.97	97

♦ Percent recovery information is provided in order to assess the performance of the method on this matrix.
ND None Detected at or above the method reporting limit
NA Not Applicable because of the sample matrix. Accuracy of the spike recovery value is reduced, since the sample concentration was greater than four times the amount spiked.

Approved by Dave Eick Date 9/28/92

Columbia Analytical Services, Inc.

October 9, 1992

Brent Jorgensen
EMCON Northwest, Inc.
15055 SW Sequoia Parkway, Suite 140
P.O. Box 231269
Portland, OR 97224

Re: **Great Western-CHEMAX/Project #0235-000.00**

Dear Brent:

Enclosed are the results of the rush samples requested for analysis on September 29, 1992, from previous work order number K925884. Preliminary results were transmitted via facsimile on September 30, 1992. For your reference, these analyses have been assigned our work order number K926019.

All analyses were performed in accordance with our laboratory's quality assurance program. Reproduction of reports is allowed only in whole, not in part. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Janice Sedlak for

Charles R. Morrow
Project Chemist

CRM/eaw

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	09/23/92
Project:	Great Western-CHEMAX/#0235-000.00	**Work Order No.:**	K926019
Sample Matrix:	Miscellaneous		

Total Metals
mg/Kg (ppm)
As Received Basis

Analyte:		Copper	Lead
EPA Method:		6010	6010
Method Reporting Limit: *		20	100
Date Analyzed:		09/30/92	09/30/92
Sample Name	**Lab Code**		
CHEMAX-001	K5884-1	27,100	ND
CHEMAX-002	K5884-2	2,640	150
Method Blank	K5884-MB	ND	ND

* MRLs are elevated because of matrix interferences.
ND None Detected at or above the method reporting limit

00001

Approved by TMSedlak Date 10/9/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	09/23/92
Project:	Great Western-CHEMAX/#0235-000.00	Work Order No.:	K926019
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

Analyte:		Copper	Chromium	Lead
EPA Method:		6010	6010	6010
Method Reporting Limit:*		20	20	100
Date Analyzed:		09/30/92	09/30/92	09/30/92
Sample Name	**Lab Code**			
CHEMAX-003	K5884-3	15,000	24,100	ND
Method Blank	K5884-MB	ND	ND	ND

* MRLs are elevated because of matrix interferences.
ND None Detected at or above the method reporting limit

Approved by _____ Date 10/9/92

00002

Columbia Analytical Services, Inc.

1317 South 13th Ave. • Kelso, WA 98626 • (206) 577-7222, FAX (206) 636-1068

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

DATE 9/23/92 PAGE 1 OF 1

PROJECT NAME Great Western - CHEMAX # 02-35-000.00

PROJECT MNGR Brent Jorgensen

COMPANY/ADDRESS EMCON / Portland Office

15055 SW Sequoia Pkwy.

PHONE (503) 624 7200

SAMPLERS SIGNATURE Brent Jorgensen

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA 418.1 ☐ Oregon 418.1 ☐	TPH Gas/BTEX 5030/8015/8020 Gas ☐ BTEX ☐	TPH 8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH - HCID	TCLP Metals ☒ VOA ☐	Semi Pest/ Metals (total or dissolved) VOA ☐ Herb ☐ List Below	Cyanide	pH, Cond., Cl, SO4, PO4, F, Br NO2, NO3 (circle)	Nitr-N, COD, Total P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020			REMARKS
CHEMAX - 001	9/23/92	9:15 AM		Concrete Chips										X		X						
CHEMAX - 002	9/23/92	9:20 AM		Wall Scrapings										X		X						
CHEMAX - 003	9/23/92	9:25 AM		Soil										X		X						

RELINQUISHED BY:	RECEIVED BY:
Signature: Brent Jorgensen	Signature: Lori K. Hawn
Printed Name: BRENT JORGENSEN	Printed Name: Lori K. Hawn
Firm: EMCON NW	Firm: CAS
Date/Time: 9/23/92	Date/Time: 9/23/92 1330

RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:
Printed Name:	Printed Name:
Firm:	Firm:
Date/Time:	Date/Time:

TURNAROUND REQUIREMENTS:

___ 24 hr ☒ 48 hr ___ 5 day

___ Standard (~ 10-15 working days)

☒ Provide Verbal Preliminary Results

☒ Provide FAX Preliminary Results

Requested Report Date 9/25/92

REPORT REQUIREMENTS

☒ I. Routine Report

___ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)

___ III. Data Validation Report (includes All Raw Data)

___ IV. CLP Deliverable Report

INVOICE INFORMATION:

P.O. #

Bill to:

SAMPLE RECEIPT:

Shipping VIA:

Shipping #:

Condition:

Lab No.:

SPECIAL INSTRUCTIONS/COMMENTS:

Need results by 1 pm Friday afternoon (9/25/92)

Note: Samples may have arsenic, chromium, copper & cyanide.

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

APPENDIX C

LABORATORY TEST RESULTS FROM SOIL SAMPLES COLLECTED ON OCTOBER 12, 1992

Columbia Analytical Services, Inc.

October 19, 1992

Brent Jorgensen
EMCON Northwest, Inc.
15055 SW Sequoia Parkway, Suite 140
P.O. Box 231269
Portland, OR 97224

Re: **Great Western Tech Center/Project #0235-007.03**

Dear Brent:

Enclosed are the results of the rush samples submitted to our laboratory on October 12, 1992. Preliminary results were transmitted via facsimile on October 16, 1992. For your reference, these analyses have been assigned our work order number K926396.

All analyses were performed in accordance with our laboratory's quality assurance program. Reproduction of reports is allowed only in whole, not in part. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Dave Ebelen /
for Charles R. Morrow
Project Chemist

CRM/sam

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	10/12/92
Project:	Great Western Tech Center/#0235-007.03	Date Analyzed:	10/15/92
Sample Matrix:	Soil	Work Order No.:	K926396

Total Arsenic
EPA Method 7060*
mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
CHEMAX-SS3A	K6396-4	1	7
CHEMAX-SS4A	K6396-6	1	5
CHEMAX-SS4B	K6396-7	1	8
CHEMAX-SS5	K6396-8	1	30
Method Blank	K6396-MB	1	ND

* Samples with elevated arsenic levels analyzed by Method 6010.
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Edelman Date 10/19/92

00001

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/12/92
Project:	Great Western Tech Center/#0235-007.03	**Work Order No.:**	K926396
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:		CHEMAX-SS1	CHEMAX-SS2A	CHEMAX-SS2B
	Lab Code:		K6396-1	K6396-2	K6396-3
Analyte	**EPA Method**	**MRL**			
Arsenic	6010	20	9,900	226	10,300
Chromium	6010	2	5,110	890	1,490
Copper	6010	2	3,500	674	3,760
Lead	6010	20	36	ND	44
Solids, Total (%)	160.3	--	91.9	98.0	94.3

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Edel / Date 10/19/92

00002

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/12/92
Project:	Great Western Tech Center/#0235-007.03	**Work Order No.:**	K926396
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:		CHEMAX-SS3A	CHEMAX-SS3B	CHEMAX-SS4A
	Lab Code:		K6396-4	K6396-5	K6396-6
Analyte	**EPA Method**	**MRL**			
Arsenic	6010	20	--	1,240	--
Chromium	6010	2	1,980	1,930	12
Copper	6010	2	427	657	42
Lead	6010	20	ND	ND	ND
Solids, Total (%)	160.3	--	96.9	96.5	97.6

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Edelman Date 10/19/92

00003

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/12/92
Project:	Great Western Tech Center/#0235-007.03	**Work Order No.:**	K926396
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:		CHEMAX-SS4B	CHEMAX-SS5	Method Blank
	Lab Code:		K6396-7	K6396-8	K6396-MB
Analyte	**EPA Method**	**MRL**			
Arsenic	6010	20	--	--	ND
Chromium	6010	2	25	282	ND
Copper	6010	2	35	60	ND
Lead	6010	20	34	ND	ND
Solids, Total (%)	160.3	--	93.5	87.0	--

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Edel Date 10/19/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/12/92
Project:	Great Western Tech Center/#0235-007.03	**Date TCLP Performed:**	10/13/92
Sample Matrix:	Soil	**Date Analyzed:**	10/15/92
		Work Order No.:	K926396

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

	Sample Name:			**CHEMAX-SS1**	**CHEMAX-SS2A**
	Lab Code:			**K6396-1**	**K6396-2**
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**		
Arsenic	3010/6010	0.1	5.0	2.6	ND
Chromium	3010/6010	0.01	5.0	47.1	11.7

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Dave Edel Date 10/19/92

00005

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	10/12/92
Project:	Great Western Tech Center/#0235-007.03	Date TCLP Performed:	10/13/92
Sample Matrix:	Soil	Date Analyzed:	10/15/92
		Work Order No.:	K926396

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

				Sample Name:	CHEMAX-SS2B	CHEMAX-SS3A
				Lab Code:	K6396-3	K6396-4
Analyte	EPA Method	MRL	Regulatory Limit♦			
Arsenic	3010/6010	0.1	5.0		11.0	ND
Chromium	3010/6010	0.01	5.0		11.6	48.2

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Dave Seligman Date 10/19/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	10/12/92
Project:	Great Western Tech Center/#0235-007.03	Date TCLP Performed:	10/13/92
Sample Matrix:	Soil	Date Analyzed:	10/15/92
		Work Order No.:	K926396

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

	Sample Name:			CHEMAX-SS3B	CHEMAX-SS4A
	Lab Code:			K6396-5	K6396-6
Analyte	EPA Method	MRL	Regulatory Limit♦		
Arsenic	3010/6010	0.1	5.0	0.2	ND
Chromium	3010/6010	0.01	5.0	26.9	0.02

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Dave Ellis Date 10/19/92

00007

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	10/12/92
Project:	Great Western Tech Center/#0235-007.03	Date TCLP Performed:	10/13/92
Sample Matrix:	Soil	Date Analyzed:	10/15/92
		Work Order No.:	K926396

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

			Sample Name:	CHEMAX-SS4B	CHEMAX-SS5
			Lab Code:	K6396-7	K6396-8
Analyte	EPA Method	MRL	Regulatory Limit♦		
Arsenic	3010/6010	0.1	5.0	ND	ND
Chromium	3010/6010	0.01	5.0	0.02	6.18

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Dave Edel.[signature] Date 10/19/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date TCLP Performed:**	10/13/92
Project:	Great Western Tech Center/#0235-007.03	**Date Analyzed:**	10/15/92
Sample Matrix:	Soil	**Work Order No.:**	K926396

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

			Sample Name:	**Method Blank**
			Lab Code:	**K6396-MB**
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**	
Arsenic	3010/6010	0.1	5.0	ND
Chromium	3010/6010	0.01	5.0	0.02

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Dave Ellel Date 10/19/92

00009

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	Date Received:	10/12/92
Project:	Great Western Tech Center/#0235-007.03	Date TCLP Performed:	10/13/92
Sample Matrix:	Soil	Date Analyzed:	10/15/92
		Work Order No.:	K926396

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

Sample Name: CHEMAX-SS1
Lab Code: K6396-1

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery♦
Arsenic	5.0	2.6	7.6	100
Chromium	5.0	47.1	51.0	78

♦ Percent recovery information is provided in order to assess the performance of the method on this matrix.

ND None Detected at or above the method reporting limit

Approved by Dave Edelen / Date 10/19/92

00011

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/12/92
Project:	Great Western Tech Center/#0235-007.03	**Date TCLP Performed:**	10/13/92
Sample Matrix:	Soil	**Date Analyzed:**	10/15/92
		Work Order No.:	K926396

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

Sample Name: CHEMAX-SS4B
Lab Code: K6396-7

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery ♦
Arsenic	5.0	ND	5.0	100
Chromium	5.0	0.02	4.70	94

♦ Percent recovery information is provided in order to assess the performance of the method on this matrix.

ND None Detected at or above the method reporting limit

Approved by Dave Edelman Date 10/19/92

00012

APPENDIX B

CHAIN OF CUSTODY INFORMATION

EMCON Northwest, Inc.

Chain of Custody / Laboratory Analysis Request

DATE 10/12/92 PAGE 1 OF 1

PROJECT Great Western Tech Center, 0235-007.03
CLIENT INFO. CONTACT Brent Jorgensen (CHEMAX) [EMCON Northwest-Pdx]
ADDRESS 15055 SW Sequoia Pkwy, Portland, OR
TELEPHONE # (503)624-7200
SAMPLERS NAME Brent Jorgensen PHONE # (503)624-7200
SAMPLERS SIGNATURE Brent Jorgensen

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) (See Special Inst.)	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K	TCLP Metals: Cr and As only	Total Metals: Cu, Cr, Pb, As				NUMBER OF CONTAINERS
1. CHEMAX - SS1	10/12/92	2^00 pm		Soil														X		X			1
2. " - SS2A	"	"		"														X		X			1
3. " - SS2B	"	"		"														X		X			1
4. " - SS3A	"	"		"														X		X			1
5. " - SS3B	"	"		"														X		X			1
6. " - SS4A	"	"		"														X		X			1
7. " - SS4B	"	"		"														X		X			1
8. CHEMAX - SS5	10/12/92	2^00 pm		"														X		X			1

ANALYSIS REQUESTED — GENERAL CHEMISTRY (Specify) — OTHER (Specify)

Relinquished By EMCON Northwest, Inc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
Signature: Brent Jorgensen	Signature:	Signature:	Shipping I.D. No.:	Total No. of Containers:
Printed Name: Brent Jorgensen	Printed Name:	Printed Name:	VIA:	Chain of Custody Seals:
Firm: EMCON Northwest, Inc.	Firm:	Firm:	Project:	Received in good condition:
Date/Time: 10/12/92 ; 2^30 pm	Date/Time:	Date/Time:		LAB NO.
Received By	**Received By**	**Received By**	**SPECIAL INSTRUCTIONS/COMMENTS**	
Signature: Lori K. Hawn	Signature:	Signature:	Retain samples. Pls. fax results when available; ATTN: Brent @ (503) 6207658,	
Printed Name: Lori K. Hawn	Printed Name:	Printed Name:	Note: Samples are in 2 small coolers,	
Firm: CAS	Firm:	Firm:	Special Note: Must Have Results by Friday morning.	
Date/Time: 10/12/92 1745	Date/Time:	Date/Time:		

APPENDIX D

LABORATORY TEST RESULTS FROM SOIL SAMPLES COLLECTED ON OCTOBER 29, 1992

Columbia Analytical Services, Inc.

November 10, 1992

Brent Jorgensen
EMCON Northwest, Inc.
15055 SW Sequoia Parkway, Suite 140
P.O. Box 231269
Portland, OR 97224

Re: **GWC-CHEMAX/Project #0235-007.03**

Dear Brent:

Enclosed are the results of the samples submitted to our laboratory on October 29, 1992. Preliminary results were transmitted via facsimile on November 5, 1992. For your reference, these analyses have been assigned our work order number K926852.

All analyses were performed in accordance with our laboratory's quality assurance program. Reproduction of reports is allowed only in whole, not in part. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Charles Morrow

Charles R. Morrow
Project Chemist

CRM/akn

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	**Work Order No.:**	K926852
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:		Set 3-S1	Set 3-S2	Set 3-S3
	Lab Code:		K6852-1	K6852-2	K6852-3
Analyte	**EPA Method**	**MRL**			
Arsenic	7060	1	5	3	3
Chromium	6010	2	90	22	131
Copper	6010	2	24	19	20
Lead	6010	20	ND	ND	ND
Chromium, Hexavalent	6010	0.1	0.8	0.1	11.2
Solids, Total (%)	160.3	--	89.4	89.2	89.2

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	**Work Order No.:**	K926852
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:		Set 3-S4	Set 3-S5	Set 3-S6
	Lab Code:		K6852-4	K6852-5	K6852-6
Analyte	**EPA Method**	**MRL**			
Arsenic	7060	1	20	18	4
Chromium	6010	2	21	21	21
Copper	6010	2	33	34	69
Lead	6010	20	ND	ND	ND
Chromium, Hexavalent	6010	0.1	ND	ND	ND
Solids, Total (%)	160.3	--	90.0	91.2	93.2

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92

Client: EMCON No
Project: GWC-CHE
Sample Matrix: Soil

K926852

Analyte	Method	MRL	Method Blank K6852-MB
Arsenic			ND
Chromium	6010		ND
Copper			ND
Lead			ND
Chromium, Hexavalent		.1	ND
Solids, Total (%)		--	--

MRL Method Reporting Limit
ND None Detected at or above

Approved by

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	**Date Analyzed:**	11/05/92
Sample Matrix:	Soil	**Work Order No.:**	K926852

Chromium, Trivalent*
EPA Method 6010
mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
Set 3-S1	K6852-1	2	89
Set 3-S2	K6852-2	2	22
Set 3-S3	K6852-3	2	120
Set 3-S4	K6852-4	2	21
Set 3-S5	K6852-5	2	21
Set 3-S6	K6852-6	2	21
Method Blank	K6852-MB	2	ND

* Calculated as the difference between Total Chromium and Hexavalent Chromium.
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92 00004

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	Date TCLP Performed:	11/03/92
Sample Matrix:	Soil	Date Analyzed:	11/05/92
		Work Order No.:	K926852

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

	Sample Name:	Set 3-S1	Set 3-S2
	Lab Code:	K6852-1	K6852-2

Analyte	EPA Method	MRL	Regulatory Limit♦		
Arsenic	3010/6010	0.1	5.0	ND	ND
Chromium	3010/6010	0.01	5.0	0.22	ND

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	**Date TCLP Performed:**	11/03/92
Sample Matrix:	Soil	**Date Analyzed:**	11/05/92
		Work Order No.:	K926852

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

			Sample Name:	**Set 3-S3**	**Set 3-S4**
			Lab Code:	**K6852-3**	**K6852-4**
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**		
Arsenic	3010/6010	0.1	5.0	ND	ND
Chromium	3010/6010	0.01	5.0	1.23	ND

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	Date TCLP Performed:	11/03/92
Sample Matrix:	Soil	Date Analyzed:	11/05/92
		Work Order No.:	K926852

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

			Sample Name:	Set 3-S5	Set 3-S6
			Lab Code:	K6852-5	K6852-6
Analyte	EPA Method	MRL	Regulatory Limit♦		
Arsenic	3010/6010	0.1	5.0	ND	ND
Chromium	3010/6010	0.01	5.0	ND	ND

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date TCLP Performed:	11/03/92
Project:	GWC-CHEMAX/#0235-007.03	Date Analyzed:	11/05/92
Sample Matrix:	Soil	Work Order No.:	K926852

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

	Sample Name:	Method Blank
	Lab Code:	K6852-MB

Analyte	EPA Method	MRL	Regulatory Limit♦	
Arsenic	3010/6010	0.1	5.0	ND
Chromium	3010/6010	0.01	5.0	ND

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	**Date TCLP Performed:**	11/03/92
Sample Matrix:	Soil	**Date Analyzed:**	11/05/92
		Work Order No.:	K926852

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

Sample Name: Set 3-S1
Lab Code: K6852-1

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery♦
Arsenic	5.0	ND	5.1	102
Chromium	5.0	0.22	5.03	96

♦ Percent recovery information is provided in order to assess the performance of the method on this matrix.

ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	**Work Order No.:**	K926852
Sample Matrix:	Soil		

Duplicate Summary
Total Metals
mg/Kg (ppm)
Dry Weight Basis

Sample Name: Set 3-S1
Lab Code: K6852-1

Analyte	EPA Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Arsenic	7060	1	5	3	4	50
Chromium	6010	2	90	82	86	9
Copper	6010	2	24	21	22	14
Lead	6010	20	ND	ND	ND	--

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morris Date 11/10/92

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	**Date Received:**	10/29/92
Project:	GWC-CHEMAX/#0235-007.03	**Work Order No.:**	K926852
Sample Matrix:	Soil		

Matrix Spike Summary
Total Metals
mg/Kg (ppm)
Dry Weight Basis

Sample Name: Set 3-S1
Lab Code: K6852-1

Analyte	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Arsenic	1	9	5	12	78	60-130
Chromium	2	45	90	125	78	60-130
Copper	2	56	24	74	89	60-130
Lead	20	112	ND	113	101	60-130

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 11/10/92

APPENDIX B

CHAIN OF CUSTODY INFORMATION

EMCON Northwest, Inc.

Chain of Custody Laboratory Analysis Request

DATE 10/29/92 PAGE 1 OF 1

PROJECT GWC - CHEMAX # 0235-007.03
CLIENT INFO. CONTACT EMCON Northwest, Inc.
ADDRESS 15055 SW Sequoia Pkwy. (Suite 140)
TELEPHONE # (503) 624-7200
SAMPLERS NAME Brent Jorgensen PHONE # (503) 624-7200
SAMPLERS SIGNATURE Brent Jorgensen

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/CLP METALS (Circle One) As, Cr	METALS (TOTAL) (See Special Inst.) As, Cr, Cu, Pb	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K						NUMBER OF CONTAINERS
1. SET 3 - S1	10/29/92	2 pm		Soil								X	X										1
2. SET 3 - S2	10/29/92	2:15 pm		Soil								X	X										1
3. SET 3 - S3	10/29/92	2:30 pm		Soil								X	X										1
4. SET 3 - S4	10/29/92	2:35 pm		Soil								X	X										1
5. SET 3 - S5	10/29/92	2:40 pm		Soil								X	X										1
6. SET 3 - S6	10/29/92	3 pm		Soil								X	X										1
7.																							
8.																							

Relinquished By EMCON Northwest, Inc.
Signature: Brent Jorgensen
Printed Name: Brent Jorgensen
Firm: EMCON NW.
Date/Time: 10/29/92 3:30 pm

Relinquished By
Signature
Printed Name
Firm
Date/Time

Relinquished By
Signature
Printed Name
Firm
Date/Time

PROJECT INFORMATION
Shipping I.D. No.
VIA
Project

SAMPLE RECEIPT
Total No. of Containers
Chain of Custody Seals
Received in good condition
LAB NO.

Received By
Signature
Printed Name
Firm
Date/Time

Received By
Signature
Printed Name
Firm
Date/Time

Received By
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS
Notes: (1) Pls. run "totals" first & call Brent w/results.
(2) Pls. indicate diff. between Cr^{6+} & Cr^{3+} wherever possible.
(3) Need results by Nov. 5 afternoon, pls. fax to Brent @ (503) 620 7658.

DISTRIBUTION: WHITE - return to originator; YELLOW: - lab; PINK - retained by originator.

APPENDIX E

WASTE PROFILES AND LAND DISPOSAL RESTRICTION FORMS

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

Waste Profile Sheet Code: WMNA 089788

This form is to be used to comply with the requirements of a waste agreement.

INSTRUCTIONS FOR COMPLETING THIS FORM ARE ATTACHED

Shaded Areas For Contractor Use Only)

Decision Expiration Date: / /

Contractor Sales Rep#: _____ Service Agr. Renewal Date: / /

A. WASTE GENERATOR INFORMATION

1. Generator Name: Great Western Chemical Co. 2. SIC Code: 2899
3. Facility Address (site of waste generation): 5700 NW Front Ave.
4. Generator City, State/Province: Portland, Oregon 5. Zip/Postal Code: 97210
6. Generator USEPA/Federal ID #: ORD 058131178 7. State/Province ID #:
8. Technical Contact: Lee Zimmerli 9. Phone: (503) 228 - 2600

B. WASTE STREAM INFORMATION (See Instructions)

1. Name of Waste: Miscellaneous Debris
2. Process Generating Waste: Debris Cleanup
3. Annual Amount/Units: 100 Cubic Yards 4. Type A ☒ Type B ☐
5. Special Handling Instructions/Supplemental Information:
6. Incidental Waste Types and Amounts: Plastic, steel, wood, soil & gravel. Note: Information regarding the specific amounts of each of these waste types is not currently available; however, soil, gravel, & plastic will likely make up at least 75% of the 100 cubic yard total.

C. TRANSPORTATION INFORMATION

1. Method of Shipment: ☐ Bulk Liquid ☐ Bulk Sludge ☑ Bulk Solid ☐ Drum/Box ☐ Other
2. Supplemental Shipping Information:
3. Is this a DOT hazardous material? ☒ No ☐ Yes (If yes, complete 4, 5 & 6) 4. Hazard Class/ID #: None
5. Reportable Quantity/Units (lb/kg): None 6. Shipping Name: Not applicable

D. TECHNICAL MANAGER DECISION (Check One) ☐ APPROVED ☐ DISAPPROVED ☐ Check if additional information is attached

If Disapproved, Explain:
If Approved, Continue.
1. Management Method(s)
2. Precautions, Conditions, or Limitations on Approval:
3. For Type A Wastes, Laboratory Analysis of a Representative Sample Was: ☐ Waived ☐ Attached
If waived, explain why:
4. List Non-WMI Facility that is Approved to Manage this Waste: Date:
Tech. Mgr. Signature: Name (Print): Date:

E. MANAGEMENT FACILITY INFORMATION / DECISION

1. Proposed Management Facility:
2. Proposed Intermediate Transfer Facility: 3. Transporter:
4. Management Facility Gen. Mgr. Decision (Check One) ☐ APPROVED ☐ DISAPPROVED
If Approved, Explain:
If Approved, List Precautions, Conditions, or Limitations on Approval:
General Mgr. Signature: Name (Print): Date:

Turn Page and Complete Side 2 (If Type B Special Waste, only complete Part J of Side 2)

Chemical Waste Management, Inc.

AL 5856
Profile #

WASTE PROFILE

Arlington to Approve; Please Rush.

☐ Check here if this is a Recertification LOCATION OF ORIGINAL _____ PDX 042

GENERAL INFORMATION

1. GENERATOR NAME: Great Western Chemical Co. Generator USEPA ID: ORD 058131178
2. Generator Address: 5700 NW Front Ave. Portland, OR 97210 Billing Address: ☐ Same 808 SW 15th Ave. Portland, OR 97205
3. Technical Contact/Phone: Ed Doheny
4. Alternate Contact/Phone: Lee Zimmerli Billing Contact/Phone: Lee Zimmerli

PROPERTIES AND COMPOSITION

5. Process Generating Waste: Debris Cleanup
6. Waste Name: Chromated Copper Arsenic Debris
- 7A. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes ☒ No ☐
- B. Identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U): D004, D007
- State Waste Codes: _____
8. Physical State @ 70°F: A. Solid ☒ Liquid ☐ Both ☐ B. Single Layer ☐ Multilayer ☒ C. Free liquid range _____ to _____ %
- 9A. pH: Range _____ to _____ or Not applicable ☒ B. Strong Odor ☐; describe none
10. Liquid Flash Point: < 73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☐ N.A. ☒ Closed Cup ☐ Open Cup ☐
- *11. CHEMICAL COMPOSITION: List ALL constituents (including halogenated organics) present in any concentration and forward available analysis.

Constituents	Range	Units	Constituents	Range	Units
Arsenic	0-2	%	Safety Equipment: (Tyvek suits, dust masks, ...etc)	0-5	%
Chromium	0-1	%			
Copper	0-1	%	Miscellaneous Debris: (wood, steel, plastic sheeting, ...etc)	0-10	%
Concrete	25-50	%			
Soil	25-50	%			
			TOTAL:	50-119	%

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

* Note: See Laboratory Test Results Attached

12. OTHER: PCBs if yes, concentration ____ ppm, PCBs regulated by 40 CFR 761 ☐. Pyrophoric ☐ Explosive ☐ Radioactive ☐
Benzene if yes, concentration ____ ppm. Shock Sensitive ☐ Oxidizer ☐ Carcinogen ☐ Infectious ☐ Other _____
13. If the waste is subject to the land ban and meets the treatment standards, check here: ____, and supply analytical results where applicable.

SHIPPING INFORMATION

14. PACKAGING: Bulk Solid ☒ Bulk Liquid ☐ Drum ☐ Type/Size: 20yd³ Drop Box Other _____
15. ANTICIPATED ANNUAL VOLUME: 20 Units: yd³ Shipping Frequency: Once Only

SAMPLING INFORMATION

16a. Sample source (drum, lagoon, pond, tank, vat, etc.) ____
Date Sampled: _____ Sampler's Name/Company: _____
16b. Generator's Agent Supervising Sampling: _____ 17. ☒ No sample required (See Instructions.) (no coverletter)

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representat as defined in 40 CFR 261 - Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator h been disclosed. I authorize CWM to obtain a sample from any waste shipment for purposes of recertification.

Lee Zimmerli (Signature) Lee Zimmerli RISK MGR (Printed (or typed) name and title) 11/20/92 (Date)

CWM Form 6000.C replaces and is equivalent to the following forms: CWM 51, CWM 6000, CWM 50 A 2 and CWM 50 B

Chemical Waste Management, Inc.

ADDENDUM TO GENERATOR'S WASTE MATERIAL PROFILE SHEET FOR LAND DISPOSAL RESTRICTIONS

CWM Location of Original _____ (shaded area for CWM use only)

A. GENERATOR INFORMATION—INSTRUCTIONS FOR COMPLETING THIS FORM ARE FOUND ON THE OPPOSITE SIDE OF THIS PAGE.

1. Generator Name: Great Western Chemical Co.
2. USEPA ID Number: O R D 0 5 8 1 3 1 1 7 8
3. Waste Profile Sheet Code: A L 5 8 5 6

B. WASTE STREAM INFORMATION

1. Is this a USEPA hazardous waste? ☒ Yes ☐ No
2. If yes, is this waste: ☒ Characteristic ☐ Listed ☐ Both

a. Is this waste a nonwastewater or a wastewater? Check ONE: ☒ Nonwastewater ☐ Wastewater

b. Identify ALL Characteristic and Listed USEPA hazardous waste numbers that apply (as defined by 40 CFR 261). For each waste number, identify the subcategory (as applicable, check none, or write in the description from 40 CFR 268.41, 268.42, and 268.43). The following waste numbers have subcategories: D001, D002, D003, D006, D008, D009, F001, F002, F003, F004, F005, F025, K006, K046, K061, K069, K071, K106, and U151.

USEPA HAZARDOUS WASTE NO.	SUBCATEGORY	
	NONE	DESCRIPTION
D04	X	
D007	X	

USEPA HAZARDOUS WASTE NO.	SUBCATEGORY	
	NONE	DESCRIPTION

To list additional USEPA waste number(s), and subcategories, use the supplemental sheet provided (CWM-6000-B). If an additional page (CWM-6000-B) is used, please check here: ☐

3. If the waste is identified as USEPA Waste No. D008, identify the total concentration of lead: _____
4. Is this waste a soil and/or debris? ☐ Yes, Soil; ☐ Yes, Debris; ☒ Yes, Both; ☐ No, Neither

C. GENERATOR CERTIFICATION—I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste material and all relevant information regarding known or suspected hazards in the posession of the generator has been disclosed.

1. Lee Zimmerli — Signature
2. Risk Manager — Title
3. Lee Zimmerli — Name (Type or Print)
4. 11-18-92 — Date

Printed on recycled paper

Chemical Waste Management, Inc.

WASTE PROFILE

BF 2917
Profile #

☐ Check here if this is a Recertification LOCATION OF ORIGINAL _____ PDX 042

GENERAL INFORMATION

1. GENERATOR NAME: Great Western Chemical Co. Generator USEPA ID: ORD 058131178
2. Generator Address: 5700 NW Front Ave. Billing Address: ☐ Same 808 SW 15th Ave.
   Portland, OR 97210 Portland, OR 97205
3. Technical Contact/Phone: Ed Doheny
4. Alternate Contact/Phone: Lee Zimmerli Billing Contact/Phone: Lee Zimmerli

PROPERTIES AND COMPOSITION

5. Process Generating Waste: Soil Cleanup
6. Waste Name: Chromated Copper Arsenic Soil

7A. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes ☒ No ☐
B. Identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U): D004, D007
State Waste Codes: _____

8. Physical State @ 70°F: A. Solid ☒ Liquid ☐ Both ☐ B. Single Layer ☐ Multilayer ☒ C. Free liquid range _____ to _____ %

9A. pH: Range _____ to _____ or Not applicable ☒ B. Strong Odor ☐; describe none

10. Liquid Flash Point: < 73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☐ N.A. ☒ Closed Cup ☐ Open Cup ☐

11. *CHEMICAL COMPOSITION: List ALL constituents (including halogenated organics) present in any concentration and forward available analysis.

Constituents	Range	Units	Constituents	Range	Units
Arsenic	0-1	%	Safety Equipment :	0-5	%
Chromium	0-1	%	(Tyvek Suits, Dust Masks, ...etc)		
Copper	0-1	%	Miscellaneous Debris :	0-10	%
Concrete	0-10	%	(Wood, Steel, Plastic Sheeting, ...etc)		
Soil	50-100	%			
			Total :	50-110	%

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%
*Note: See laboratory test results attached

12. OTHER: PCBs if yes, concentration ____ ppm, PCBs regulated by 40 CFR 761 ☐. Pyrophoric ☐ Explosive ☐ Radioactive ☐
Benzene if yes, concentration ____ ppm. Shock Sensitive ☐ Oxidizer ☐ Carcinogen ☐ Infectious ☐ Other _____

13. If the waste is subject to the land ban and meets the treatment standards, check here: ____, and supply analytical results where applicable.

SHIPPING INFORMATION

14. PACKAGING: Bulk Solid ☒ Bulk Liquid ☐ Drum ☐ Type/Size: 20yd³ Drop Box Other _____
15. ANTICIPATED ANNUAL VOLUME: 20 Units: yd³ Shipping Frequency: once only

SAMPLING INFORMATION

16a. Sample source (drum, lagoon, pond, tank, vat, etc.) Pit
Date Sampled: 12-14-92 Sampler's Name/Company: Rick Read
16b. Generator's Agent Supervising Sampling: EMCON Northwest Inc. 17. ☐ No sample required (See Instructions.)

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize CWM to obtain a sample from any waste shipment for purposes of recertification.

Lee Zimmerli Lee Zimmerli, Risk Manager 12-24-92
Signature Printed (or typed) name and title Date

CWM Form 6000-C replaces and is equivalent to the following forms: CWM-51, CWM-6000, CWM 50-A-2 and CWM 50-B

recycled paper

Chemical Waste Management, Inc.

ADDENDUM TO GENERATOR'S WASTE MATERIAL PROFILE SHEET FOR LAND DISPOSAL RESTRICTIONS

CWM Location of Original _____ (shaded area for CWM use only)

A. GENERATOR INFORMATION—INSTRUCTIONS FOR COMPLETING THIS FORM ARE FOUND ON THE OPPOSITE SIDE OF THIS PAGE.

1. Generator Name: Great Western Chemical Co.
2. USEPA ID Number: ORD058133117 8
3. Waste Profile Sheet Code: BF2917

B. WASTE STREAM INFORMATION

1. Is this a USEPA hazardous waste? ☒ Yes ☐ No
2. If yes, is this waste: ☒ Characteristic ☐ Listed ☐ Both
   a. Is this waste a nonwastewater or a wastewater? Check ONE: ☒ Nonwastewater ☐ Wastewater
   b. Identify ALL Characteristic and Listed USEPA hazardous waste numbers that apply (as defined by 40 CFR 261). For each waste number, identify the subcategory (as applicable, check none, or write in the description from 40 CFR 268.41, 268.42, and 268.43). The following waste numbers have subcategories: D001, D002, D003, D006, D008, D009, F001, F002, F003, F004, F005, F025, K006, K046, K061, K069, K071, K106, and U151.

USEPA HAZARDOUS WASTE NO.	SUBCATEGORY	
	NONE	DESCRIPTION
D004	X	
D007	X	

USEPA HAZARDOUS WASTE NO.	SUBCATEGORY	
	NONE	DESCRIPTION

To list additional USEPA waste number(s), and subcategories, use the supplemental sheet provided (CWM-6000-B). If an additional page (CWM-6000-B) is used, please check here: ☐

3. If the waste is identified as USEPA Waste No. D008, identify the total concentration of lead: _____
4. Is this waste a soil and/or debris? ☐ Yes, Soil; ☐ Yes, Debris; Yes, Both; ☒ No, Neither

C. GENERATOR CERTIFICATION—I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste material and all relevant information regarding known or suspected hazards in the posession of the generator has been disclosed.

1. Lee Zimmerli — Signature
2. Risk Manager — Title
3. Lee Zimmerli — Name (Type or Print)
4. 12-30-92 — Date

Chemical Waste Management, Inc.

WASTE PROFILE

BF 2918
Profile #

☐ Check here if this is a Recertification LOCATION OF ORIGINAL _____ PDX 042

GENERAL INFORMATION

1. GENERATOR NAME: Great Western Chemical Co. Generator USEPA ID: ORD 058131178
2. Generator Address: 5700 NW Front Ave. Portland, OR 97210 Billing Address: ☐ Same 808 SW 15th Ave. Portland, OR 97205
3. Technical Contact/Phone: Ed Doheny
4. Alternate Contact/Phone: Lee Zimmerli Billing Contact/Phone: Lee Zimmerli

PROPERTIES AND COMPOSITION

5. Process Generating Waste: Soil Cleanup
6. Waste Name: Chromated Copper Arsenic Decon Liquid
7. A. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes XX No ☐
   B. Identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U): D004, D007
   State Waste Codes: _____
8. Physical State @ 70°F: A. Solid ☐ Liquid ☒ Both ☐ B. Single Layer ☐ Multilayer ☒ C. Free liquid range NA to _____ %
9. A. pH: Range 2.0 to 4.0 or Not applicable ☐ B. Strong Odor ☐; describe _____
10. Liquid Flash Point: < 73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☐ N.A. ☒ Closed Cup ☐ Open Cup ☐
11. *CHEMICAL COMPOSITION: List ALL constituents (including halogenated organics) present in any concentration and forward available analysis.

Constituents	Range	Units	Constituents	Range	Units
Arsenic	0-1.5	%			
Chromium	0-1.5	%			
Copper	0-1	%			
Water	97-100	%			
Total:	97-104				

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

* Note: See laboratory analysis attached

12. OTHER: PCBs if yes, concentration ____ ppm, PCBs regulated by 40 CFR 761 ☐. Pyrophoric ☐ Explosive ☐ Radioactive ☐
    Benzene if yes, concentration ____ ppm. Shock Sensitive ☐ Oxidizer ☐ Carcinogen ☐ Infectious ☐ Other Corrosive
13. If the waste is subject to the land ban and meets the treatment standards, check here: ____, and supply analytical results where applicable.

SHIPPING INFORMATION

14. PACKAGING: Bulk Solid ☐ Bulk Liquid ☐ Drum ☒ Type/Size: 55 Gallon Drum Other _____
15. ANTICIPATED ANNUAL VOLUME: 150 Units: gallons Shipping Frequency: Once Only

SAMPLING INFORMATION

16a. Sample source (drum, lagoon, pond, tank, vat, etc.) Drum
Date Sampled: 12-16-92 Sampler's Name/Company: Rick Read
16b. Generator's Agent Supervising Sampling: EMCON Northwest, Inc. 17. ☐ No sample required (See Instructions.)

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize CWM to obtain a sample from any waste shipment for purposes of recertification.

Lee Zimmerli — Signature
Lee Zimmerli, Risk Manager — Printed (or typed) name and title
12-30-92 — Date

CWM Form 6000.C replaces and is equivalent to the following forms: CWM-51, CWM 6000, CWM 50 A 2 and CWM 50 B

Chemical Waste Management, Inc.

ADDENDUM TO GENERATOR'S WASTE MATERIAL PROFILE SHEET FOR LAND DISPOSAL RESTRICTIONS

CWM Location of Original _____ (shaded area for CWM use only)

A. GENERATOR INFORMATION—INSTRUCTIONS FOR COMPLETING THIS FORM ARE FOUND ON THE OPPOSITE SIDE OF THIS PAGE.

1. Generator Name: Great Western Chemical Co.
2. USEPA ID Number: ORD058113117 8
3. Waste Profile Sheet Code: BF2918

B. WASTE STREAM INFORMATION

1. Is this a USEPA hazardous waste? ☒ Yes ☐ No
2. If yes, is this waste: ☒ Characteristic ☐ Listed ☐ Both

a. Is this waste a nonwastewater or a wastewater? Check ONE: Nonwastewater ☒ Wastewater

b. Identify ALL Characteristic and Listed USEPA hazardous waste numbers that apply (as defined by 40 CFR 261). For each waste number, identify the subcategory (as applicable, check none, or write in the description from 40 CFR 268.41, 268.42, and 268.43). The following waste numbers have subcategories: D001, D002, D003, D006, D008, D009, F001, F002, F003, F004, F005, F025, K006, K046, K061, K069, K071, K106, and U151.

USEPA HAZARDOUS WASTE NO.	SUBCATEGORY	
	NONE	DESCRIPTION
D004	X	
D007	X	

USEPA HAZARDOUS WASTE NO.	SUBCATEGORY	
	NONE	DESCRIPTION

To list additional USEPA waste number(s), and subcategories, use the supplemental sheet provided (CWM-6000-B). If an additional page (CWM-6000-B) is used, please check here: ☐

3. If the waste is identified as USEPA Waste No. D008, identify the total concentration of lead: _____
4. Is this waste a soil and/or debris? ☐ Yes, Soil; ☐ Yes, Debris; Yes, Both; ☒ No, Neither

C. GENERATOR CERTIFICATION—I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste material and all relevant information regarding known or suspected hazards in the posession of the generator has been disclosed.

1. Lee Zimmerli — Signature
2. Risk Manager — Title
3. Lee Zimmerli — Name (Type or Print)
4. 12-30-92 — Date

APPENDIX F

DECEMBER 1992 LABORATORY TEST RESULTS FOR NONHAZARDOUS SOIL AND DEBRIS

Columbia Analytical Services, Inc.

December 21, 1992 Service Request No.: K927729

Brent Jorgensen
EMCON Northwest, Inc.
15055 SW Sequoia Parkway, Suite 140
P.O. Box 231269
Portland, OR 97224

Re: **Chemax Phase II/Project #0235-007.04**

Dear Brent:

Enclosed are the results of the rush sample submitted to our laboratory on December 10, 1992. Preliminary results were transmitted via facsimile on December 15, 1992. For your reference, these analyses have been assigned our service request number K927729.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Eileen M. Arnold
Project Chemist

EMA/gb

P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/10/92
Project:	Chemax Phase II/#0235-007.04	**Date TCLP Performed:**	12/14/92
Sample Matrix:	Soil	**Date Analyzed:**	12/15/92
		Work Order No.:	K927729

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

				Sample Name:	Non Haz Box #4	Method Blank
				Lab Code:	K7729-4	K7729-MB
Analyte	**EPA Method**	**MRL**	**Regulatory Limit◆**			
Arsenic	3010/6010	0.1	5.0		ND	ND
Chromium	3010/6010	0.01	5.0		0.34	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
◆ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990

Approved by Eileen M Arnold Date 12/22/92

00002

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/10/92
Project:	Chemax Phase II/#0235-007.04	**Date TCLP Performed:**	12/14/92
Sample Matrix:	Soil	**Date Analyzed:**	12/15/92
		Work Order No.:	K927729

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

Sample Name: Non Haz Box #4
Lab Code: K7729-4

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery♦
Arsenic	5.0	ND	5.2	104
Chromium	5.0	0.34	5.06	94

ND None Detected at or above the method reporting limit
♦ Percent recovery information is provided in order to assess the performance of the method on this matrix.

Approved by Eileen M Arnold Date 12/22/92

Columbia Analytical Services inc.
1317 South 13th Ave. • Kelso, WA 98626 • (206) 577-7222, FAX (206) 636-1068

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

DATE 12/10/92 PAGE 1 OF 1.

PROJECT NAME CHEMAX PHASE II # 0235-007.04
PROJECT MNGR BRENT JORGENSEN
COMPANY/ADDRESS EMCON
15055 SW. SEQUOIA Parkway, Suite 140
Portland, Oregon 97224 PHONE (503) 6247200
SAMPLERS SIGNATURE Richard R. Read

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA 418.1 ☐ Oregon 418.1 ☐	TPH/Gas/BTEX 5030/8015/8020 Gas ☐ BTEX ☐	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH-HCID	(TCLP) Metals ☒ As, Cr VOA ☐ Semi VOA ☐ Pest/Herb ☐	Metals (total or dissolved) List Below	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br, NO_2, NO_3 (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020			REMARKS
Haz Box #2	12/10	2pm	K7729-1	Soil/Debris	1									X								(#4249)
Haz Box #3	12/10	2pm	-2	Soil/Debris	1									X								(#4277)
Haz Box #1	12/10	2pm	-3	"	1									X								(#4279)
Non Haz Box #4	12/10	2pm	-4	"	1									X								(no #)

RELINQUISHED BY:	RECEIVED BY:
Signature: Brent Jorgensen	Signature: Lori K. H.
Printed Name: Brent Jorgensen	Printed Name: Lori K. Hawn
Firm: EMCON Northwest	Firm: CAS
Date/Time: 12/10/92 / 330pm	Date/Time: 12/10/92 1800

TURNAROUND REQUIREMENTS:
- ___ 24 hr (X) 48 hr ___ 5 day
- ___ Standard (~10-15 working days)
- ___ Provide Verbal Preliminary Results
- ___ Provide FAX Preliminary Results
- Requested Report Date ______

REPORT REQUIREMENTS
- ___ I. Routine Report
- ___ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
- ___ III. Data Validation Report (includes All Raw Data)
- ___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O. # ______
Bill to: ______

SAMPLE RECEIPT:
Shipping VIA: ______
Shipping #: ______
Condition: ______
Lab No.: K92-7729

RELINQUISHED BY:	RECEIVED BY:
Signature	Signature
Printed Name	Printed Name
Firm	Firm
Date/Time	Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:
Note: Analyze ONLY "NON Haz Box #4". Retain other samples, ~~for further~~ & Contact B. Jorgensen for FURTHER INSTRUCTIONS.

DISTRIBUTION: WHITE - return to or ; YELLOW - lab; PINK - retained by originator

400-05

r00004

Columbia Analytical Services, Inc.

January 5, 1993 Service Request No.: K927795

Brent Jorgensen
EMCON Northwest, Inc.
15055 SW Sequoia Parkway, Suite 140
P.O. Box 231269
Portland, OR 97224

Re: **CHEMAX/Project #0235.007.04**

Dear Brent:

Enclosed are the results of the samples submitted to our laboratory on December 16, 1992. Preliminary results were transmitted via facsimile on December 29, 1992. For your reference, these analyses have been assigned our service request number K927795.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Lynda Huckestein for

Eileen M. Arnold
Project Chemist

EMA/sam

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	Date Received:	12/16/92
Project:	CHEMAX/#0235.007.04	Date TCLP Performed:	12/18/92
Sample Matrix:	Soil	Date Analyzed:	12/28/92
		Work Order No.:	K927795

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

			Sample Name:	Non Haz Box-5	Non Haz Box-6
			Lab Code:	K7795-1	K7795-2
Analyte	EPA Method	MRL	Regulatory Limit♦		
Arsenic	3010/6010	0.1	5.0	ND	0.2
Chromium	3010/6010	0.01	5.0	0.70	9.15

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990

Approved by Lynda Hackenstein Date 1/5/93

00002

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	CHEMAX/#0235.007.04	**Date TCLP Performed:**	12/18/92
Sample Matrix:	Soil	**Date Analyzed:**	12/28/92
		Work Order No.:	K927795

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

				Sample Name:	Non Haz Box-7	Method Blank
				Lab Code:	K7795-3	K7795-MB
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**			
Arsenic	3010/6010	0.1	5.0		0.2	ND
Chromium	3010/6010	0.01	5.0		ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990

Approved by Lynda Hackerstein Date 1/5/93

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	Date Received:	12/16/92
Project:	CHEMAX/#0235.007.04	Date TCLP Performed:	12/18/92
Sample Matrix:	Soil	Date Analyzed:	12/28/92
		Work Order No.:	K927795

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

Sample Name: Non Haz Box-5
Lab Code: K7795-1

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery♦
Arsenic	5.0	ND	5.4	108
Chromium	5.0	0.70	5.46	95

ND None Detected at or above the method reporting limit

♦ Percent recovery information is provided in order to assess the performance of the method on this matrix.

Approved by Lynda Hucksteen Date 1/5/93

APPENDIX B

CHAIN OF CUSTODY INFORMATION

K7C1175

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

Columbia Analytical Services INC.
1317 South 13th Ave. • Kelso, WA 98626 • (206) 577-7222, FAX (206) 636-1068

DATE 12/11/92 PAGE 1 OF 1

PROJECT NAME CHEMAX # 0235.007.04
PROJECT MNGR. Brent Jorgensen
COMPANY/ADDRESS EMCON
15055 SW SEQUOIA Parkway suite 140
Portland, Or. 97224 PHONE 624-7200
SAMPLERS SIGNATURE Richard Read

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	TCLP Cr, As	REMARKS
NON HAZ DUX - 5	12/11/92	NOON	K7755-1	Soil & Debris	1	X	
" - 6	"	"	-2	"	1	X	
" - 7	"	"	-3	"	1	X	

ANALYSIS REQUESTED: Base/Neu/Acid Organics GC/MS 625/8270; Volatile Organics GC/MS 624/8240; Halogenated or Aromatic Volatiles 601/8010 ☐ or 602/8020 ☐; Pesticides/PCBs 608/8080; Total Petroleum Hydrocarbons EPA 418.1 ☐ Oregon 418.1 ☐; TPH/Gas/BTEX/8020/8015/8020 Gas ☐ BTEX ☐; TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐; TPH - HCID; TCLP Cr, As Semi Pest/ Metals ☐ VOA ☐ VOA ☐ Herb ☐; Metals (total or dissolved) List Below; Cyanide; pH, Cond, Cl, SO4, PO4, F, Br NO2, NO3 (circle); NH3-N, COD, Total P, TKN, TOC (circle); Total Organic Halides (TOX) 9020

RELINQUISHED BY:	RECEIVED BY:
Signature: Brent Jorgensen	Signature:
Printed Name: Brent Jorgensen	Printed Name: Grace Jack
Firm: EMCON NW	Firm: CAS
Date/Time: 12/15/92 9AM	Date/Time: 12/16/92 0925

RELINQUISHED BY:	RECEIVED BY:
Signature	Signature
Printed Name	Printed Name
Firm	Firm
Date/Time	Date/Time

TURNAROUND REQUIREMENTS:
___ 24 hr ___ 48 hr ___ 5 day
___ Standard (~ 10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX Preliminary Results
Requested Report Date ____

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O. # ____
Bill to: ____

SAMPLE RECEIPT:
Shipping VIA: ____
Shipping #: ____
Condition: OK
Lab No.: K92-7755

SPECIAL INSTRUCTIONS/COMMENTS:
TCLP - Cr & As only.
NOTE: Report separately from other CHEMAX samples.

DISTRIBUTION: WHITE - return to; YELLOW - lab; PINK - retained by originator

400-05

APPENDIX G

DECEMBER 1992 WASTE MANAGEMENT OF OREGON, INC., TRANSPORTATION AND DISPOSAL SERVICE TICKETS

Piggyback

601431

Waste Management of Oregon, Inc.
5330 N.E. Skyport Way
Portland, OR 97218

10.53 Tons

SERVICE TICKET AGREEMENT/NON-HAZARDOUS WASTES

ORDER NUMBER	SERVICE DATE
086296	12/15/92
TIME IN	**TIME OUT**
500 pm	300 pm
ROUTE ID	**DISPOSAL ID** / **DISPOSAL TICKET**
R3	01M / 64701
SIGNATURE	**COD AMOUNT**
NOT REQRD	

DIVISION NUMBER: 898898 ACCOUNT NUMBER: 0684964 SERVICE TYPE: 06

CUSTOMER: GREAT WESTERN CHEM/COL RIDGE

ADDRESS: 5700 NW FRONT AVE

CITY: PORTLAND 97210

ACTION	ORD QTY	SERVICE DESCRIPTION	WASTE TYPE	BILL CODE	MEASURE	BILL QUANTITY	AMOUNT
EX	1	~~20~~ W ~~40~~ SYD CONTAINER		2X 155	LY	1.00	
				695	LY	489.81	

COMMENTS: FROM THIS YARD Profile #: 089788

SERVICES ACCEPTED SUBJECT TO THE TERMS AND CONDITIONS ON THE REVERSE SIDE AND PAYMENT AGREED TO BE MADE IN ACCORDANCE WITH THE CONTRACTOR'S CURRENT RATE SCHEDULE.

CUSTOMER SIGNATURE _____

CONTRACTOR SIGNATURE Dennis Ols 12-15-92

(56) R3D, 412, ~~[illegible]~~ m, 40y.

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(503) 454-2030

№ 64701

DATE:	15 DEC 92
TIME:	09:39 AM
CUSTOMER NAME:	Goal Western Chemical
CUSTOMER NUMBER:	
TRACTOR NUMBER:	412
TRAILER NUMBER:	412A
SEAL NUMBER:	
METRO INVOICE NO.:	089188
GROSS WEIGHT:	59840 LB
TARE WEIGHT-TRACTOR:	
TARE WEIGHT-TRAILER:	17720
NET WEIGHT:	42120

21.06 tons x 46.44 = $978.02

GATEHOUSE:	[illegible]
DRIVER:	[illegible]
TIPPER:	

REMARKS: [illegible]

601431/086296
601432/086297

DEC-30-1992 18:45 FROM WASTE MGMT. OF OREGON TO 6207658 P.14

Piggyback

601433

Waste Management of Oregon, Inc.
5330 N.E. Skyport Way
Portland, OR 97218

SERVICE TICKET AGREEMENT/NON-HAZARDOUS WASTES

ORDER NUMBER	SERVICE DATE
086298	12/15/92
TIME IN	TIME OUT
500 AM	300 PM
ROUTE ID	DISPOSAL ID / DISPOSAL TICKET
R5	NW 017 6470
SIGNATURE	COD AMOUNT
NOT REQRD	

DIVISION NUMBER 898898 / ACCOUNT NUMBER 0684964 / SERVICE TYPE 06

CUSTOMER GREAT WESTERN CHEM/COL RIDGE

ADDRESS 5700 NW FRONT AVE

CITY PORTLAND 97210 5.00

ACTION	ORD QTY	SERVICE DESCRIPTION	WASTE TYPE	BILL CODE	MEASURE	BILL QUANTITY	AMOUNT
EX	1	165LU 16.5YD CONTAINER		165	LY	1	
		DUMP TICKET #64703				1	

COMMENTS FROM THIS YARD, Profile # 089789

SERVICES ACCEPTED SUBJECT TO THE TERMS AND CONDITIONS ON THE REVERSE SIDE AND PAYMENT AGREED TO BE MADE IN ACCORDANCE WITH THE CONTRACTOR'S CURRENT RATE SCHEDULE

CUSTOMER SIGNATURE _____

CONTRACTOR SIGNATURE [signature] OWS 12/15/92

06 R5Dg 411 ~~[illegible]~~ 334 2loads

Oregon Waste Systems

A Waste Management Company

18177 Cedar Springs Lane
Arlington, Oregon 97812
(503) 454-2030

№ 64703

DEC 15 AM 9:42

DATE:	15 DEC 92
TIME:	09:40 AM
CUSTOMER NAME:	[illegible] Chemical
CUSTOMER NUMBER:	
TRACTOR NUMBER:	411
TRAILER NUMBER:	411A
SEAL NUMBER:	
METRO INVOICE NO.: [illegible]	C89788
GROSS WEIGHT:	82660 LB
TARE WEIGHT-TRACTOR:	
TARE WEIGHT-TRAILER:	48600
NET WEIGHT:	34060

17.03 tons x 46.44 = $790.87

GATEHOUSE:	[illegible]
DRIVER:	[illegible]
TIPPER:	

REMARKS: [illegible] gravel — [illegible]

601433/086298
601434/086299

601535

Waste Management of Oregon, Inc.
5330 N.E. Elrypon Way
Portland, OR 97211

SERVICE TICKET AGREEMENT/NON-HAZARDOUS WASTES

ORDER NUMBER	SERVICE DATE
086386	12/16/92
TIME IN	TIME OUT

DIVISION NUMBER 898898 ACCOUNT NUMBER 0584264 SERVICE TYPE 05

CUSTOMER GREAT WESTERN CHEM/COL RIDGE

ADDRESS 5700 NW FRONT AVE

CITY PORTLAND 97210

ROUTE ID	DISPOSAL ID	DISPOSAL TICKET
R3	017	64801
SIGNATURE	COD AMOUNT	
NOT REQRD		

ACTION	ORD QTY	SERVICE DESCRIPTION	WASTE TYPE	BILL CODE	MEASURE	BILL QUANTITY	AMOUNT
NR	1	200LW 20YD CONTAINER		200	LY	1	
				692		530	

COMMENTS

SERVICES ACCEPTED SUBJECT TO THE TERMS AND CONDITIONS ON THE REVERSE SIDE AND PAYMENT AGREED TO BE MADE IN ACCORDANCE WITH THE CONTRACTOR'S CURRENT RATE SCHEDULE.

CUSTOMER SIGNATURE _____

CONTRACTOR SIGNATURE Jennifer Potter 12-16-92

04/ 8230, 412, ~~[illegible]~~ 30m, 201/

Oregon Waste Systems

A Waste Management Company

18177 Cedar Springs Lane
Arlington, Oregon 97812
(503) 454-2030

Nº 64801

DATE: 16 DEC 92

TIME: 10:23 AM

CUSTOMER NAME: Great western Chem.

CUSTOMER NUMBER: 601535

TRACTOR NUMBER:

TRAILER NUMBER:

SEAL NUMBER:

METRO INVOICE NO.: 089788

GROSS WEIGHT: 45560 LB

TARE WEIGHT-TRACTOR: 31340

TARE WEIGHT-TRAILER:

NET WEIGHT: 14,220

7.11 tons x 46.44 = 330.18

GATEHOUSE: Jennifer

DRIVER: [illegible]

TIPPER:

REMARKS: 601535/086384

Piggy Back

601536

Waste Management of Oregon, Inc.
6330 N.E. Skyport Way
Portland, OR 97218

SERVICE TICKET AGREEMENT/NON-HAZARDOUS WASTES

ORDER NUMBER	SERVICE DATE
086387	12/16/92
TIME IN	TIME OUT

DIVISION NUMBER 898898 ACCOUNT NUMBER 0584964 SERVICE TYPE 08

CUSTOMER GREAT WESTERN CHEM/COL RIDGE

ADDRESS 5700 NW FRONT AVE

CITY PORTLAND 97210

ROUTE ID	DISPOSAL ID	DISPOSAL TICKET
R5	017	64796
SIGNATURE	COD AMOUNT	
NOT REQRD		

ACTION	ORD QTY	SERVICE DESCRIPTION	WASTE TYPE	BILL CODE	MEASURE	BILL QUANTITY	AMOUNT
NR	1	20OLW 20YD CONTAINER		200	LY	100	
				695	LY	[redacted]	
		Dump Ticket # 64796				365.48	

COMMENTS
FROM THIS YARD

SERVICES ACCEPTED SUBJECT TO THE TERMS AND CONDITIONS ON THE REVERSE SIDE AND PAYMENT AGREED TO BE MADE IN ACCORDANCE WITH THE CONTRACTOR'S CURRENT RATE SCHEDULE.

CUSTOMER SIGNATURE _____

CONTRACTOR SIGNATURE Jennifer Potter 12-16-92

Disp 1.30

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(503) 454-2030

No 64796

DATE: 16 DEC 92
TIME: 09:41 AM
CUSTOMER NAME: Great Western Chem
CUSTOMER NUMBER: ~~[illegible]~~
TRACTOR NUMBER: 601536 & 7
TRAILER NUMBER:
SEAL NUMBER:
METRO INVOICE NO.: 0397788

GROSS WEIGHT: 79200 LB
TARE WEIGHT-TRACTOR: 47720
TARE WEIGHT-TRAILER: ~~[illegible]~~
NET WEIGHT: ~~[illegible]~~

15.74 tons x 46.44 = $730.90

GATEHOUSE:
DRIVER:
TIPPER:

REMARKS:

601536/086357
601537/086358

APPENDIX H

CHEMICAL WASTE MANAGEMENT, INC., HAZARDOUS WASTE MANIFESTS

SENT BY: C W M I WESTERN REG ; 1- 4-93 ; 16:30 ; 15106516625→ 503 620 7658:# 4

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST

NATIONAL RESPONSE CENTER 1-800-424-
OREGON ACCIDENT RESPONSE CENTER 1-800-452-0

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

121466

Form Approved OMB No 2050-0039 Expires 9 30

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. ORD 0 5 8 1 1 3 1 1 1 2 8 1 9 Manifest Document No. 8 0 1 0 1

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Chemax
5700 NW Front Ave
Portland Or 97210

A. State Manifest Document Number

B. State Generator's ID

4. Generator's Phone (503) 223-1614

5. Transporter 1 Company Name
Chemical Waste Man

6. US EPA ID Number
O R D 0 9 9 1 4 0 1 6 8

C. State Transporter's ID

D. Transporter's Phone (503) 454-2643

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Chemical Waste Management
Of The Northwest
Star Route
Arlington, Oregon 97812

10. US EPA ID Number
O R D 0 8 9 4 5 2 3 5 3

G. State Facility's ID

H. Facility's Phone 503 454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No	Type	13. Total Quantity	14. Unit Wt/Vol	EPA/ST Waste No.
GENERATOR a. RQ Hazardous Waste Solid Nos ORM-E NA 9189 (Arsenic & Chromium)	1	CM	19141610	P	D004 D007
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
Cont. Debris

K. Handling Codes for Wastes Listed Above

13. a. AL5856 ERG 31
b.
c.
d.

Waste Profile Sheet Number(s)
Emergency 1-800-424 9300

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: EDWARD DOHENY
Signature: Edward Doheny (for Chemax)
Month Day Year: 1 2 1 4 9 2

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: JOHN E CHILDERS
Signature: John E. Childers
Month Day Year: 1 2 1 4 9 2

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Month Day Year:

19. Discrepancy Indication Space

FACILITY

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name:
Signature:
Month Day Year: 1 2 14 92

EPA Form 8700-22 (Rev. 3/86) Previous editions are obsolete.

5

SENT BY: C W M I WESTERN REG : 1- 4-93 : 16:31 : 15106516625→ 503 620 7658:# 5

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST 131004 · 136007 1411604

NATIONAL RESPONSE CENTER 1-800-424-[illegible]
OREGON ACCIDENT RESPONSE CENTER 1-800-452-[illegible]

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved OMB No. 2050-0039 Expires [illegible]

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: ORD058131175
Manifest Document No.: 99 2 0015
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address:
CHEMAX
5700 NW FRONT AV.
PORTLAND OR. 97221

4. Generator's Phone (503) 227-1616

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: CHEMICAL WASTE MANAGEMENT INC.
6. US EPA ID Number: ILD099202681
C. State Transporter's ID
D. Transporter's Phone 503-454-2643

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address:
Chemical Waste Management
Of The Northwest
Star Route
Arlington, Oregon 97812

10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone 503-454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. EPA Waste No.
a. RQ HAZARDOUS WASTE SOLID N.O.S. ORM-E NA9189 (D004 D007)	001	CM	22008	P	[illegible]
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above: [illegible] AL5856 · 3 32 F 20 4
K. Handling Codes for Wastes Listed Above · Cu. Yd. [illegible]

15. Special Handling Instructions and Additional Information — Waste Profile Sheet Number(s)
a. AL5856 ERG # 31
b.
c. EMERGENCY PHONE 1-800-424-9300
d.

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: EDWARD DOHENY — Signature: Edward Doheny (for Chemax) — Month Day Year: 1 2 1 7 9

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: JOHN E CHILDERS — Signature: John E. Childers — Month Day Year: 1 2 1 7 9

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: [illegible signature] — Signature: [illegible signature] — Month Day Year: 1 2 1 7 9

EPA Form 8700-22 (Rev. 9/88) Previous editions are obsolete

SENT BY: C W M I WESTERN REG ; 1- 4-93 ; 16:32 ; 15106516625→ 503 620 7658;# 6

CHEMICAL WASTE MANAGEMENT
OF THE NORTHWEST

NATIONAL RESPONSE CENTER 1-800-424-8[illegible]
OREGON ACCIDENT RESPONSE CENTER 1-800-452-03[illegible]

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 141547 Form Approved OMB No. 2050-0039 Expires [illegible]

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No: OR D 0 5 8 / 3 / / 7 8 9 — Manifest Document No: 2 0 0 4
2. Page 1 of
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
CHEMAX
5700 NW FRONT ST.
PORTLAND OR. 97221.

A. State Manifest Document Number [illegible]
B. State Generator's ID [illegible]

4. Generator's Phone (503) 227-1616

5. Transporter 1 Company Name: CHEMICAL WASTE MANAGEMENT INC
6. US EPA ID Number: I L D 0 9 9 2 0 2 6 8 1
C. State Transporter's ID
D. Transporter's Phone 503-454-2643

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Chemical Waste Management
Of The Northwest
Star Route
Arlington, Oregon 97812

10. US EPA ID Number: O R D 0 8 9 4 5 2 3 5 3
G. State Facility's ID
H. Facility's Phone [illegible]

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. EPA/State Waste No.
a. RQ HAZARDOUS WASTE SOLID N.O.S. ORM-E NA 9189 (D004 D007)	0 0 1	CM	2 / 0 0 0	P	D004 D007
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above [illegible] K. Handling Codes for Wastes Listed Above [illegible] D81 [illegible] 95 [illegible] 0200

15. Special Handling Instructions and Additional Information — Waste Profile Sheet Number(s)
a. AL 6552
b. ERG # 31
c. EMERGENCY PHONE # 1-800-424-9300
d.

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: EDWARD DOHENY — Signature: Edward Doheny for Chemax — Month Day Year: 1 2 1 6 9

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: JOHN E CHILDERS — Signature: John E. Childers — Month Day Year: 1/ 1 / / 6 / 9

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19
Printed/Typed Name: DAVID [illegible] STEVE[illegible] — Signature: [illegible] — Month Day Year: 1 2 1 6 9

EPA Form 8700-22 (Rev. 9/88) Previous editions are obsolete.

SENT BY: C W M I WESTERN REG ; 1- 4-93 ; 16:33 ; 15106516625→ 503 620 7658;# 7

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST

NATIONAL RESPONSE CENTER 1-800-424-88[illegible]
OREGON ACCIDENT RESPONSE CENTER 1-800-452-031[illegible]

Please print or type (Form designed for use on elite (12 pitch) typewriter.)

Form Approved OMB No. 2050-0039. Expires 9-30-[illegible]

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	ORD 058131178
Manifest Document No.	92003
2. Page 1 of	1
Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address	CHEMAX 5700 NW FRONT AV. PORTLAND OR.
4. Generator's Phone	(503-227-1616)
A. State Manifest Document Number	
B. State Generator's ID	
5. Transporter 1 Company Name	CHEMICAL WASTE MANAGEMENT INC
6. US EPA ID Number	IL D 0 9 9 2 0 2 6 8 1
C. State Transporter's ID	
D. Transporter's Phone	503-454-2643
7. Transporter 2 Company Name	
8. US EPA ID Number	
E. State Transporter's ID	
F. Transporter's Phone	
9. Designated Facility Name and Site Address	Chemical Waste Management Of The Northwest Star Route Arlington, Oregon 97812
10. US EPA ID Number	ORD089452353
G. State Facility's ID	
H. Facility's Phone	503-454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. EPA Waste No.
a. RQ HAZARDOUS WASTE SOLID N.O.S. ORM-E NA9189 (D004 D007)	001	CM	23116	P	D004 D007
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above: [illegible] AL5856 [illegible] LB 29-30 F

K. Handling Codes for Wastes Listed Above: [illegible] 2E 2F 4 [illegible]

15. Special Handling Instructions and Additional Information Waste Profile Sheet Number(s)

a. AL5856 ERG # 31

b.

c. EMERGENCY PHONE # 1-800-424-9300

d.

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
Richard J. Laine	Richard J Laine	1 2 1 5 9

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
JOHN E CHILDRES	John E. Childress	1 2 1 5 9

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
Becky Sumner	Becky Sumner	1 2 1 5 9

EPA Form 8700-22 (Rev. 9/88) Previous editions are obsolete.

SENT BY: C W M I WESTERN REG ; 1- 4-93 ; 16:34 ; 15106516625→ 503 620 7658;# 8

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST

NATIONAL RESPONSE CENTER 1-800-
OREGON ACCIDENT RESPONSE CENTER 1-800-452-

Please print or type (Form designed for use on elite (12-pitch) typewriter) 12/18/62

Form Approved OMB No 2050-0039 Expires

UNIFORM HAZARDOUS WASTE MANIFEST

1\. Generator's US EPA ID No: ORD045811311 Manifest Document No. 2819 4010

2\. Page 1 of 1

Information in the shaded areas is not required by Federal law

3\. Generator's Name and Mailing Address: Chemax, 5900 NW Front Ave, Portland Or 97201

4\. Generator's Phone (503) 642-1616

A. State Manifest Document Number

B. State Generator's ID

5\. Transporter 1 Company Name: Chemical Waste Man.

6\. US EPA ID Number: ILD099202641

C. State Transporter's ID

D. Transporter's Phone (503) 454-2643

7\. Transporter 2 Company Name

8\. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9\. Designated Facility Name and Site Address: Chemical Waste Management Of The Northwest, Star Route, Arlington, Oregon 97812

10\. US EPA ID Number: ORD089452353

G. State Facility's ID

H. Facility's Phone 503-454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	EPA/L Waste No.
a. RQ Hazardous Waste Solid Nos ORM E NA 9189 (Arsenic + Chromium)	1	CM	24630	P	D004 D007
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above: a. Cont. Debris

K. Handling Codes for Wastes Listed Above: WPC ALKBK6; Handling Code D8; Cu Yd. 10.99; Lbs 24040; Area 2B, S 8, D H, C 9A-2B, PR; Gal.

15\. Special Handling Instructions and Additional Information: Waste Profile Sheet Number(s) a. AL5856 ERG #31 b. Emergency # 1-800 424-9300 c. d.

16\. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: EDWARD DOHENY Signature: Edward Doheny (for Chemax) Month Day Year 1 2 1 4 9 2

17\. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: James M Hassing Signature: James M Hassing Month Day Year 1 2 1 4 9 2

18\. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name Signature Month Day Year

19\. Discrepancy Indication Space

20\. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19

Printed/Typed Name Signature Month Day Year

Previous editions are obsolete

APPENDIX I

LABORATORY TEST RESULTS FROM SOIL AND LIQUID SAMPLES COLLECTED ON DECEMBER 14 AND 16, 1992

Columbia Analytical Services, Inc.

December 23, 1992 Service Request No.: K927794

Brent Jorgensen
EMCON Northwest, Inc.
15055 SW Sequoia Parkway, Suite 140
P.O. Box 231269
Portland, OR 97224

Re: **Chemax/Project #0235-007.04**

Dear Brent:

Enclosed are the results of the rush samples submitted to our laboratory on December 16, 1992. Preliminary results were transmitted via facsimile on December 18, 1992. For your reference, these analyses have been assigned our service request number K927794.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Charles Morrow

Eileen M. Arnold
Project Chemist

EMA/gb

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Work Order No.:**	K927794
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:		CS-CHEMAX-2	CS-CHEMAX-4	CS-CHEMAX-7
	Lab Code:		K7794-1	K7794-2	K7794-3
Analyte	**EPA Method**	**MRL**			
Arsenic	7060	1	350	613	5,300
Chromium	6010	2	1,230	4,110	2,280
Chromium, Hexavalent	3060/7195/6010	0.1	666	1,390	477
Chromium, Trivalent[a]	--	2	564	2,720	1,803
Copper	6010	2	145	875	1,360
Solids, Total (%)	160.3	--	92.6	93.8	907

MRL Method Reporting Limit
a Trivalent Chromium = Total Chromium minus Hexavalent Chromium

Approved by Charles Morrow Date 12/24/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Work Order No.:**	K927794
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:		CS-CHEMAX-10	CS-CHEMAX-14	CS-CHEMAX-16
	Lab Code:		K7794-4	K7794-5	K7794-6
Analyte	**EPA Method**	**MRL**			
Arsenic	7060	1	76	49	5
Chromium	6010	2	152	535	170
Chromium, Hexavalent	3060/7195/6010	0.1	48.5	361	42.9
Chromium, Trivalent[a]	--	2	104	174	127
Copper	6010	2	80	29	18
Solids, Total (%)	160.3	--	90.8	93.6	92.0

MRL Method Reporting Limit
a Trivalent Chromium = Total Chromium minus Hexavalent Chromium

Approved by Charles Morrison Date 12/24/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Work Order No.:**	K927794
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:		CS-CHEMAX-21	CS-CHEMAX-24	CS-CHEMAX-26
	Lab Code:		K7794-7	K7794-8	K7794-9
Analyte	**EPA Method**	**MRL**			
Arsenic	7060	1	77	6	4
Chromium	6010	2	50	185	55
Chromium, Hexavalent	3060/7195/6010	0.1	23.6	75.7	4.3
Chromium, Trivalent[a]	--	2	26	109	51
Copper	6010	2	71	22	15
Solids, Total (%)	160.3	--	88.8	90.5	90.6

MRL Method Reporting Limit
a Trivalent Chromium = Total Chromium minus Hexavalent Chromium

Approved by Charles Morrow Date 12/24/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Work Order No.:**	K927794
Sample Matrix:	Soil		

Total Metals
mg/Kg (ppm)
Dry Weight Basis

	Sample Name:	CS-CHEMAX-35	Method Blank
	Lab Code:	K7794-10	K7794-MB
Analyte	**EPA Method**	**MRL**	
Arsenic	7060	1	6 ND
Chromium	6010	2	21 ND
Chromium, Hexavalent	3060/7195/6010	0.1	2.1 ND
Chromium, Trivalent[a]	--	2	19 ND
Copper	6010	2	18 ND
Solids, Total (%)	160.3	--	92.9 ND

MRL Method Reporting Limit
ND None Detected
a Trivalent Chromium = Total Chromium minus Hexavalent Chromium

Approved by Charles Morris Date 12/24/92

00005

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Date TCLP Performed:**	12/16/92
Sample Matrix:	Soil	**Date Analyzed:**	12/18/92
		Work Order No.:	K927794

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

				Sample Name:	CS-CHEMAX-2	CS-CHEMAX-4
				Lab Code:	K7794-1	K7794-2
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**			
Arsenic	3010/6010	0.1	5.0		0.5	0.7
Chromium	3010/6010	0.01	5.0		29.6	61.0
Copper	3010/6010	0.01	--		1.52	17.5

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990

Approved by Charles Morrow Date 12/24/92

00006

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Date TCLP Performed:**	12/16/92
Sample Matrix:	Soil	**Date Analyzed:**	12/18/92
		Work Order No.:	K927794

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

			Sample Name:	CS-CHEMAX-7	CS-CHEMAX-10
			Lab Code:	K7794-3	K7794-4
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**		
Arsenic	3010/6010	0.1	5.0	5.7	ND
Chromium	3010/6010	0.01	5.0	18.1	3.69
Copper	3010/6010	0.01	--	18.2	0.22

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 12/24/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Date TCLP Performed:**	12/16/92
Sample Matrix:	Soil	**Date Analyzed:**	12/18/92
		Work Order No.:	K927794

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

			Sample Name:	CS-CHEMAX-14	CS-CHEMAX-16
			Lab Code:	K7794-5	K7794-6
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**		
Arsenic	3010/6010	0.1	5.0	ND	ND
Chromium	3010/6010	0.01	5.0	19.3	2.82
Copper	3010/6010	0.01	--	0.14	0.02

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 12/24/92

00008

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Date TCLP Performed:**	12/16/92
Sample Matrix:	Soil	**Date Analyzed:**	12/18/92
		Work Order No.:	K927794

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

			Sample Name:	CS-CHEMAX-21	CS-CHEMAX-24
			Lab Code:	K7794-7	K7794-8
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**		
Arsenic	3010/6010	0.1	5.0	ND	ND
Chromium	3010/6010	0.01	5.0	0.99	4.47
Copper	3010/6010	0.01	--	0.12	0.03

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 12/24/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Date TCLP Performed:**	12/16/92
Sample Matrix:	Soil	**Date Analyzed:**	12/18/92
		Work Order No.:	K927794

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

	Sample Name:	CS-CHEMAX-26	CS-CHEMAX-35
	Lab Code:	K7794-9	K7794-10

Analyte	EPA Method	MRL	Regulatory Limit♦		
Arsenic	3010/6010	0.1	5.0	ND	ND
Chromium	3010/6010	0.01	5.0	0.28	0.02
Copper	3010/6010	0.01	--	ND	0.03

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 12/24/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date TCLP Performed:**	12/16/92
Project:	Chemax/#0235-007.04	**Date Analyzed:**	12/18/92
Sample Matrix:	Soil	**Work Order No.:**	K927794

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

	Sample Name:			**Method Blank**
	Lab Code:			**K7794-MB**
Analyte	**EPA Method**	**MRL**	**Regulatory Limit♦**	
Arsenic	3010/6010	0.1	5.0	ND
Chromium	3010/6010	0.01	5.0	ND
Copper	3010/6010	0.01	--	ND

MRL Method Reporting Limit
♦ From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 12/24/92

00011

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/16/92
Project:	Chemax/#0235-007.04	**Date TCLP Performed:**	12/16/92
Sample Matrix:	Soil	**Date Analyzed:**	12/18/92
		Work Order No.:	K927794

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
mg/L (ppm) in TCLP Extract

Sample Name: CS-CHEMAX-2
Lab Code: K7794-1

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery♦
Arsenic	5.0	0.5	5.8	106
Chromium	5.0	29.6	34.4	96
Copper	5.0	1.52	[a]6.48	99

♦ Percent recovery information is provided in order to assess the performance of the method on this matrix.

a Post digestion spike result.

Approved by Charles Morrow Date 12/24/92

00012

Columbia Analytical Services, Inc.

1317 South 13th Ave. • Kelso, WA 98626 • (206) 577-7222, FAX (206) 636-1068

K1114

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

DATE 12/14/92 PAGE 2 OF 2

PROJECT NAME CHEMAX # 0235-007.04

PROJECT MNGR Brent Jorgensen

COMPANY/ADDRESS EMCON NW Inc.

15055 SW SEQUOIA Parkway, Suite 140

Portland, Or. 97224 PHONE 642-7200

SAMPLERS SIGNATURE Richard R. Read

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSIS REQUESTED: TCLP As, Cr, Cu; Semi Pest/Metals (total or dissolved) As, Cr, Cu	REMARKS
~~CS-CHEMAX-29~~	~~12/14/92~~	~~16:46~~		Soil Below	1	X X	
CS-CHEMAX-35	12/14/92	17:00	K7794-10	"	1	X X	

RELINQUISHED BY:	RECEIVED BY:
Signature: Richard Read	Signature: Ruth Allison
Printed Name: Richard READ	Printed Name: Ruth ALLISON
Firm: EMCON	Firm: CAS
Date/Time: 12/15/92 8:36	Date/Time: 12/16/92 0800

TURNAROUND REQUIREMENTS:

___ 24 hr X 48 hr ___ 5 day

___ Standard (~ 10-15 working days)

___ Provide Verbal Preliminary Results

___ Provide FAX Preliminary Results

Requested Report Date: 12/18

REPORT REQUIREMENTS

___ I. Routine Report

___ II. Report (includes DUP,MS, MSD, as required, may be charged as samples)

___ III. Data Validation Report (includes All Raw Data)

___ IV.CLP Deliverable Report

INVOICE INFORMATION:

P.O. #

Bill to:

SAMPLE RECEIPT:

Shipping VIA:

Shipping #:

Condition:

Lab No.:

RELINQUISHED BY:	RECEIVED BY:
Signature	Signature
Printed Name	Printed Name
Firm	Firm
Date/Time	Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

TCLP - Cr, Cu, As

Total - Cr, Cu, As (Also Report Cr^{3+}, Cr^{6+})

Note: #29 will Be delivered to CAS on 12/16/92

[NOTE: Please Rush (48 HR)

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

K1174

Columbia Analytical Services inc.
1317 South 13th Ave. • Kelso, WA 98626 • (206) 577-7222, FAX (206) 636-1068

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

DATE 12-14-92 PAGE 1 OF 2

PROJECT NAME CHEMAX # 0235-007.04

PROJECT MNGR Brent Jorgensen

COMPANY/ADDRESS Emcon N.W. Inc
15055 SW SEQUOIA Parkway Suite 140
Portland, Or. 97224 PHONE 624-7200

SAMPLERS SIGNATURE Richard R. Read

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA 418.1 ☐ Oregon 418.1 ☐	TPH/Gas/BTEX 5030/8015/8020 Gas ☐ BTEX ☐	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH - HCID	(TCLP) Metals ~~EP~~ VOA Semi Pest/Herb ☐ — Cr, As, Cu	Metals (total or dissolved) List Below — Cr, As, Cu (total)	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br, NO_2, NO_3 (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020			REMARKS
CS-CHEMAX-2	12/14/92	11:57	K7794-1	Soil & Debris	1									X	X							
CS-CHEMAX-4	12/14/92	12:17	-2	"	1									X	X							
CS-CHEMAX-7	12/14/92	12:37	-3	"	1									X	X							
CS-CHEMAX-10	12/14/92	13:00	-4	"	1									X	X							
CS-CHEMAX-14	12/14/92	14:34	-5	"	1									X	X							
CS-CHEMAX-16	12/14/92	15:05	-6	"	1									X	X							
CS-CHEMAX-21	12/14/92	15:26	-7	"	1									X	X							
CS-CHEMAX-24	12/14/92	15:45	-8	"	1									X	X							
CS-CHEMAX-26	12/14/92	16:04	-9	"	1									X	X							
~~CS-CHEMAX-28~~	~~12/14/92~~	~~16:30~~		~~"~~	~~1~~									~~X~~	~~X~~							

RELINQUISHED BY:	RECEIVED BY:
Signature: Richard Read	Signature: Ruth Allison
Printed Name: Richard READ	Printed Name: Ruth Allison
Firm: EMCON	Firm: CAS
Date/Time: 12/15/92 8:35	Date/Time: 12/16/92 0800

TURNAROUND REQUIREMENTS:
___ 24 hr X 48 hr ___ 5 day
___ Standard (~10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX Preliminary Results
Requested Report Date 12/18

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O. #
Bill to:

SAMPLE RECEIPT:
Shipping VIA:
Shipping #:
Condition:
Lab No.:

RELINQUISHED BY:	RECEIVED BY:
Signature	Signature
Printed Name	Printed Name
Firm	Firm
Date/Time	Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

(NOTE: PLS RUSH 48hr)

TCLP - Cr, As, Cu

Total Cr, As, Cu (Also, Report HEXAVALENT & Trivalent Cr)

Note: #28 WILL BE Delivered to CAS ON 12/16/92

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05